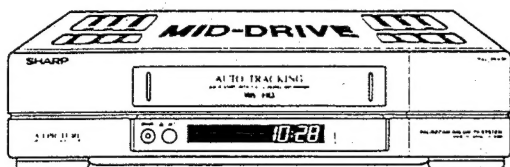




V24777

SHARP SERVICE MANUAL

S91K9VC-B36B/


VHS VIDEO CASSETTE RECORDER

MODEL VC-B36B

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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SPECIFICATIONS

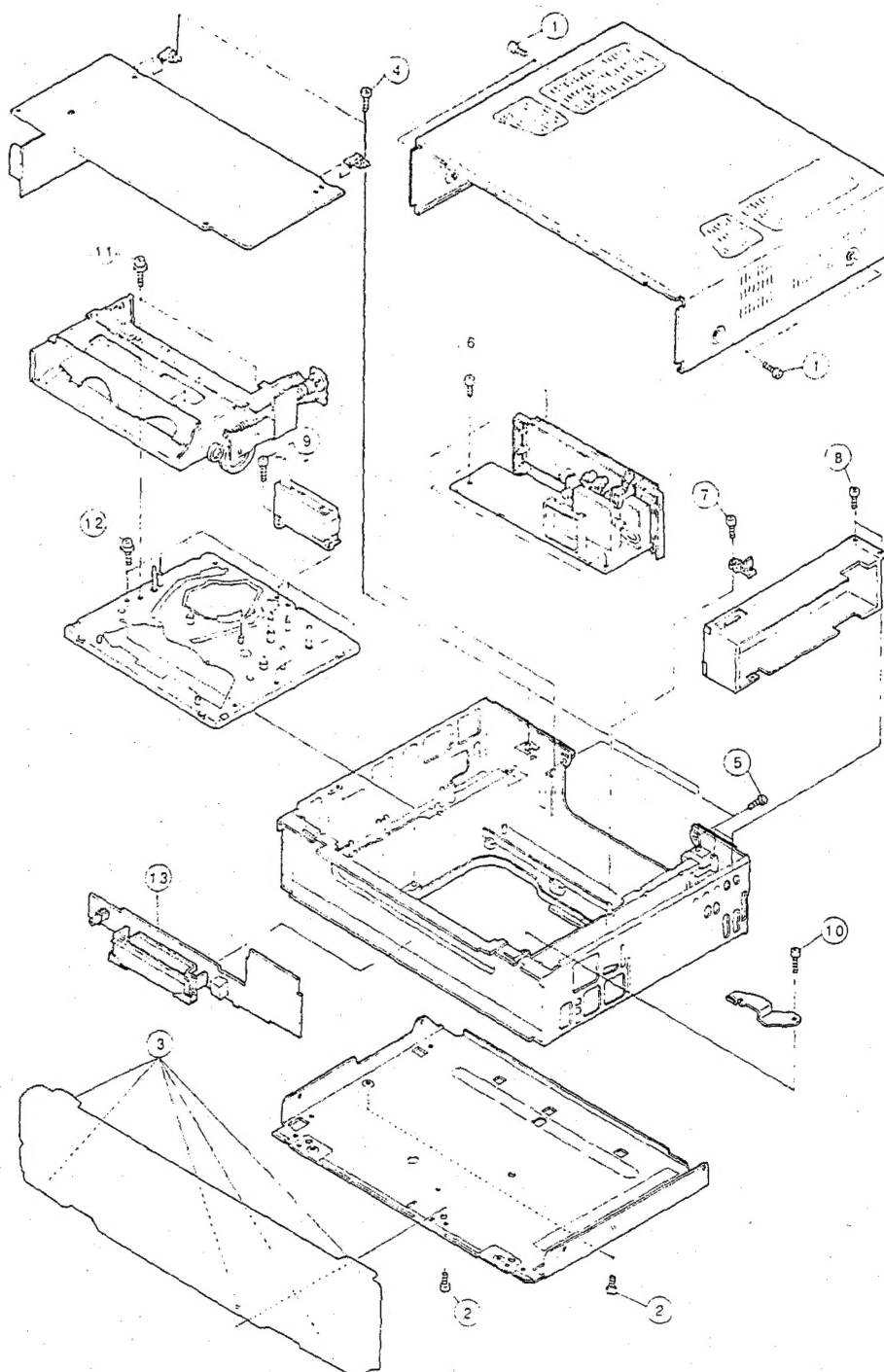
Format:	VHS PAL standard
Video recording system:	Two rotary head helical scan system
Video signal:	PAL/SECAM colour and B/G, D/K signals, 625 lines
Recording playing time:	240min max. with SHARP E - 240 tape (PAL/MESECAM) 160min max. with SHARP T-160 tape (NTSC playback)
Tape width:	12.7 mm
Tape speed:	23.39 mm/sec. (PAL/MESECAM) 33.35 mm/sec. (NTSC playback)
Antenna:	75 ohm unbalanced
Receiving channel:	VHF Channel E2-E12, S1-S20 UHF Channel E21 - E 69
RF converter output signal:	UHF Channel E30 - E39 (Adjustable). Preset to E36 Channel
Power requirement:	AC 220V, 50 Hz
Power consumption:	Approx. 19W (220V/50Hz)
Operating temperature:	5°C to 40°C
Storage temperature:	- 20°C to 60°C
Weight:	Approx. 4.5 kg
Dimensions:	380 mm (W) × 325 mm (D) × 89.8 mm (H)
VIDEO	
Input:	1.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
AUDIO	
Input:	Line: - 8 dBs, more than 47k ohm
Output:	Line: - 8 dBs, less than 1k ohm
Accessories included:	Antenna 75 ohm coaxial connector cable (plug provided) Operation Manual Infrared remote control Battery AC Cord

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.

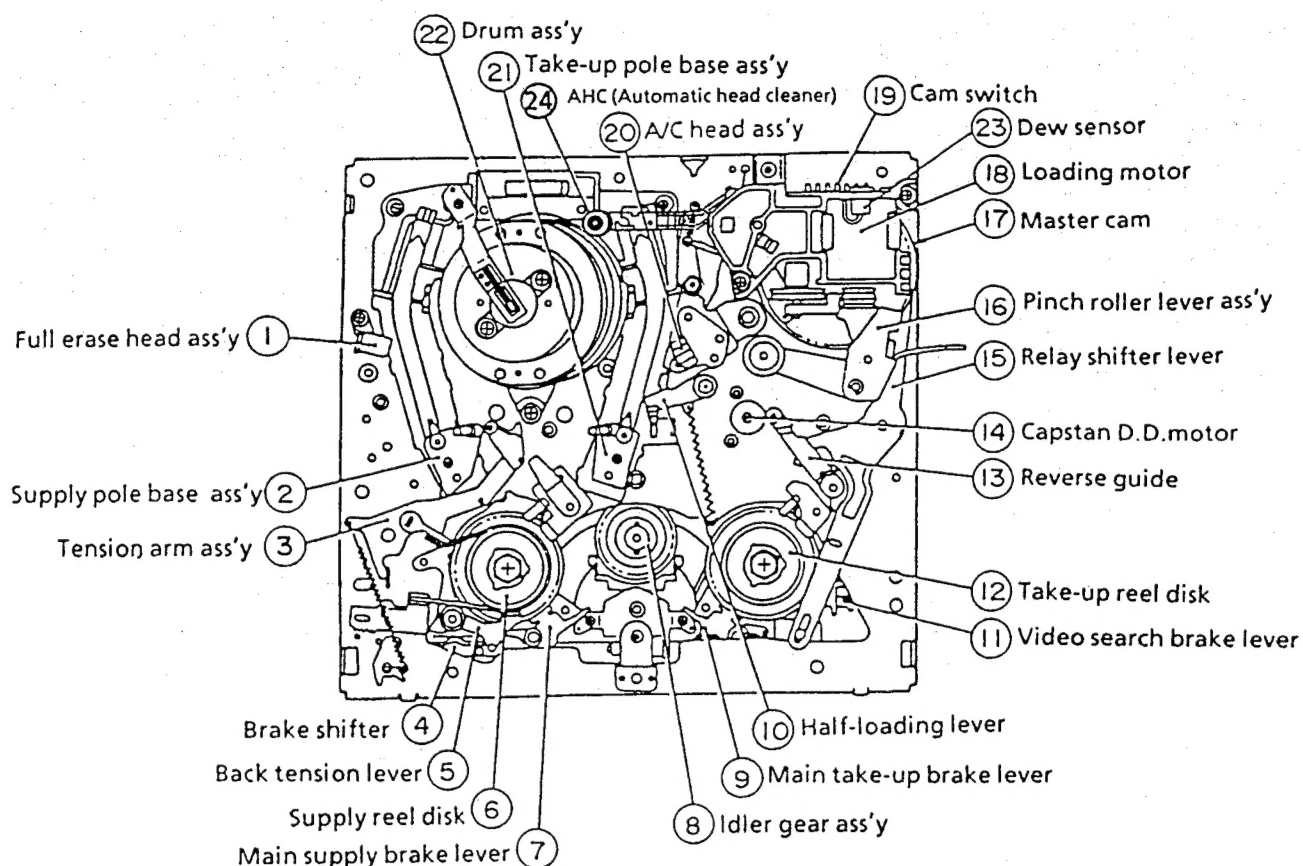
Note: The antenna must correspond to the new standard DIN 45325 (IEC 169 - 2) for combined UHF/VHF antenna with 75 ohm connector.

DISASSEMBLY AND REASSEMBLY

1. Remove 4 screws ① from the top cabinet, and remove the top cabinet by sliding it backward.
2. Remove 3 screws ② from the bottom plate, and remove the bottom plate by sliding it backward.
3. Remove 5 clips ③ from the upper and lower parts of front panel, respectively, and remove the front panel.
4. Remove 2 screws ④ and the clip from the main PWB holder.
5. Remove 2 screws ⑤ from the antenna terminal board.
6. Remove 2 screws ⑥ from the tuner IF PWB.
7. Remove 1 screw ⑦ from the power unit holder.
8. Remove 2 screws ⑧ from the power unit.
9. Remove 2 screws ⑨ from the head amp unit.
10. Remove 1 screw ⑩ from the cassette housing control assembly.
11. Remove 2 cassette housing control assembly mounting screws ⑪.
12. Remove 3 mechanism chassis mounting screws ⑫.
13. Remove 2 clips from the timer PWB ⑬.

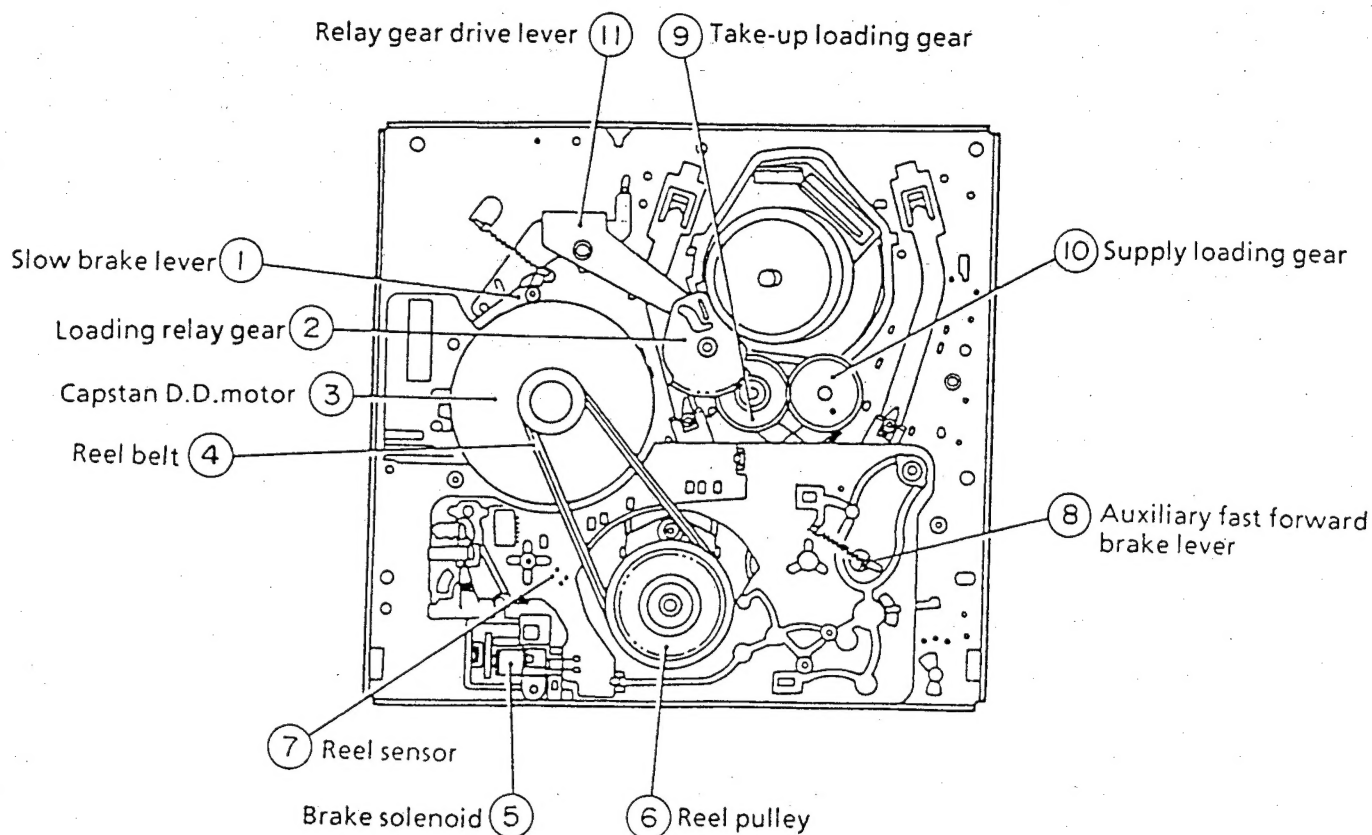


FUNCTION OF MAJOR MECHANICAL PARTS (TOP VIEW)



No.	Function	No.	Function
1.	Full erase head ass'y Erase the whole records on the tape in the recording mode.	13.	Reverse guide Pulls out the tape in the video search rewind mode, and controls the tape drive train height with the upper and lower guides.
3.	Tension arm ass'y Detects the tension of tape while running, and brakes the supply reel disk via the tension band.	15.	Relay shifter lever Transmits the operation of the master cam to the brake shifter, and operates the reverse guide.
4.	Brake shifter Set the position of brake or the like in accordance with the modes such as stop and playback.	16.	Pinch roller lever ass'y Press-fits the tape to the capstan during tape running. The right protrusion switches the clutch of the cassette housing control assembly in "tape eject", and makes the mechanism eject the tape.
5.	Back tension lever Brakes the supply reel disk to a certain degree to prevent tape slackening during "half-loading", "loading" and "shifting from playback to picture scan rewind".	17.	Master cam Turns clockwise during loading, and counterclockwise during unloading, and moves the shifter or the like in accordance with each mode.
7.	Main supply brake lever Brakes the supply reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.	18.	Loading motor A motive power which drives the mechanism. It transmits the power to the master cam and cassette housing control assembly via the belt.
9.	Main take-up brake lever Brakes the take-up reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.	19.	Cam switch Rotates synchronously with the master cam, and detects the position of each mode by means of the internal switch.
10.	Half-loading lever Bring the tape in contact with the A/C head, putting it in half-loading state in the fast forward or rewind mode.	23.	Dew sensor An element which detects condensation inside the unit. This element is activated, when it senses condensation, to interrupt the mechanism.
11.	Video search brake lever It is in contact with the take-up reel disk normally, and brakes it to a certain degree. It applies larger brake in the video search rewind mode.		

FUNCTION OF MAJOR MECHANICAL PARTS (BOTTOM VIEW)



No.	Function	No.	Function
1.	Slow brake lever Gets in contact with the capstan D.D. motor linking to the master cam in the slow still mode, and brakes it to a certain degree.	7.	Reel sensor An element which sheds the light onto the reflection plate affixed to the bottom side of the reel disk, and detects the rotation of the reel disk through receiving the reflected light.
3.	Capstan D.D. motor A motive power which runs the tape. It transmits the power via the reel belt.	8.	Auxiliary fast forward brake lever Brakes the supply reel disk to a certain degree in the fast forward and rewind modes.
4.	Reel belt Transmits the power to run the tape to the reel pulley.	9.	Take-up loading gear Shifts the take-up pole base and guide roller via the loading relay gear, and applies the tape around the drum assembly, as well as transmits the power to the supply loading gear.
5.	Brake solenoid Adsorbs and holds the brake shifter in the fast forward and rewind modes, and releases it in the stop mode.	10.	Supply loading gear Shifts the supply pole base and guide roller via the take-up loading gear, and applies the tape around the drum assembly.
6.	Reel pulley transmits the power of the capstan D.D. motor to the reel disk via the reel idler.	11.	Relay gear drive lever Transmits the movement of the master cam to the take-up loading gear via the loading relay gear.







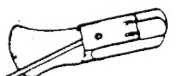
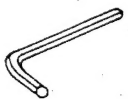

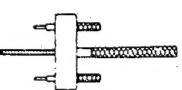
ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS





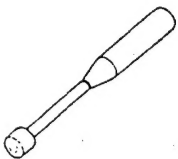


Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly replacement, for example).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original working condition.

TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1	Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height
2	Master Plane Jig	JiGMP0001	BY		
3	A/C Head Tilt Adjusting Jig	JiGACH-F18	BU		This Jig is used for setting the A/C head tilt.
4	Torque Gauge (90g)	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
	Torque Gauge (1.2 kg)	JiGTG1200	CN		
5	Gauge Head	JiGTH0006	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.
7	Tension Gauge (300g)	JiGSG0300	BF		There are two Gauges used for the tension measurements, 300 g and 2.0 kg.
	Tension Gauge (2.0kg)	JiGSG2000	BS		
8	Hex Wrench (0.9mm)	JiGHW0009	AE		These Jigs are used for loosening or tightening special hexagon type screws.
	Hex Wrench (1.2mm)	JiGHW0012	AE		
	Hex Wrench (1.5mm)	JiGHW0015	AE		
9	Alignment Tape (PAL)	VROCPSV	CK		These tapes are especially used for electrical fine adjustment.
	Alignment Tape (NTSC)	VROATSV			
	Alignment Tape (NTSC)	VRONBZZS			
10	Drum Replacing Jig	JiGDT-0001	BG		This is used for replacement of the VCR's upper drum.

No.	Jig Item	Part No.	Code	Configuration	Remarks
11	Tension Gauge Adapter	JiGADP003	BK		This Jig is used with the tension gauge. Rotary Transformer Clearance Adjusting Jig.
12	Special Bladed Screwdriver	JiGDRIVERH-4	AP		This Screwdriver is used for adjusting the guide roller height.
13	Tension Band and Plate Adjusting Jig	JiGDRIVER-6	BM		This Jig is used for adjusting the tension band and tension plate.
14	Torque Driver	JiGTD1200	CB		This is used to screw down resin-made parts: the specified torque is 5 kg.
15	Box Driver	JiGDRIVER110-7	AS		This Jig is used for height adjustment of the A/C head, and X-position.
		JiGDRIVER110-4	AV		This Jig is used for height adjustment of the retaining guide.
16	Retaining Guide Height Adjusting Jig	JiGGH-F18	BU		This Jig is used for height adjustment of the retaining guide.
17	Reverse Guide Height Adjusting Jig	JiGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.

MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Parts	Maintained	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	3000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Clean with pure high quality isopropyl alcohol.
Supply impedance roller (inner hole and shaft)			<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		Clean tape contact part with the specified cleaning liquid.
Supply impedance roller flange		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Retaining guide		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Slant pole		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Video head		<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	Poor S/N ratio, no colour	Clean tape contact area with the specified cleaning liquid.
Full-erase head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Poor colour, beating	
A/C head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sound too small or distorted	
Capstan D.D. Motor		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, uneven colour	
Pinch roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt			<input type="checkbox"/>		<input type="radio"/>	<input type="checkbox"/>	No tape running, tape slack, no fast forward/rewind motion	
Loading belt			<input type="checkbox"/>		<input type="radio"/>	<input type="checkbox"/>	Cassette not loaded or unloaded	
Cassette loading belt			<input type="checkbox"/>		<input type="radio"/>	<input type="checkbox"/>		
Tension band ass'y						<input type="radio"/>	Lateral image swing	
Loading Motor						<input type="radio"/>	Cassette not loaded or unloaded	
AHC (Automatic Head Cleaner)			<input type="radio"/>		<input type="radio"/>	<input type="radio"/>		Replace the roller of the cleaner when it wears down. Just change the AHC roller assembly for new one.
Reel block*							See the chart below.	
•See the table below for servicing the reel block parts.								
Supply/Take-up reel disks			<input type="checkbox"/>		<input type="radio"/>	<input type="checkbox"/>	No tape running, tape slack	Clean with pure high quality isopropyl alcohol.
Video search brake lever					<input type="radio"/>			
Idler gear ass'y					<input type="radio"/>		No tape running	
Reel Pulley			<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		
Main supply/take-up brake levers					<input type="radio"/>		Tape slack	

NOTE: ○: Part replacement.
☐: Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).
△: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000 hrs).

If the reading is out of the specified value, clean or replace the part.

REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

• Removal

1. Set the cassette ejected condition in the cassette eject mode.
2. Unplug the recorder from the main source.
3. Follow the procedures below in the specified order.
 - a) Remove the cassette loading belt ①.
 - b) Disconnect the FFC (Full Flat Cable) ②.
 - c) Remove the cassette housing installation screws ③.
 - d) Slide and pull out the cassette housing control assembly ④ upward.

4. In removal and reassembly, take care not to hit the cassette housing control assembly or tools against the guide pin, drum, or the like thereabout.
5. Place the unit in the eject mode in removal or reassembly of the cassette housing control assembly.
6. Load the cassette once onto the cassette housing control assembly after reassembly. (If the cassette housing control assembly normally operates after this, the phases of mechanism and the cassette controller are accurately adjusted after ejection.)

MECHANICAL OPERATION CHECK WITHOUT CASSETTE

When power is on, the general operations of the mechanism can be checked without a cassette. Note the following points.

1. Check video search rewind and rewind, rotating the take-up reel disk ⑤ by hand (in either normal or reverse direction). If it is not rotated, the reel sensor works to shift the mechanism to the eject mode.
2. When the stop button is pressed, the mechanism does not stop at a normal stop position. It shifts to the eject mode and stops.
3. When the stop button is pressed in the playback, video search rewind, and video search forward modes, the supply reel disk ⑥ keeps on rotating for several seconds for elimination of tape slack in the course of shifting to the eject mode. In such a case, rotate the take-up reel disk ⑤ somewhat by hand, and the supply reel disk ⑥ stops, which can reduce the working time.

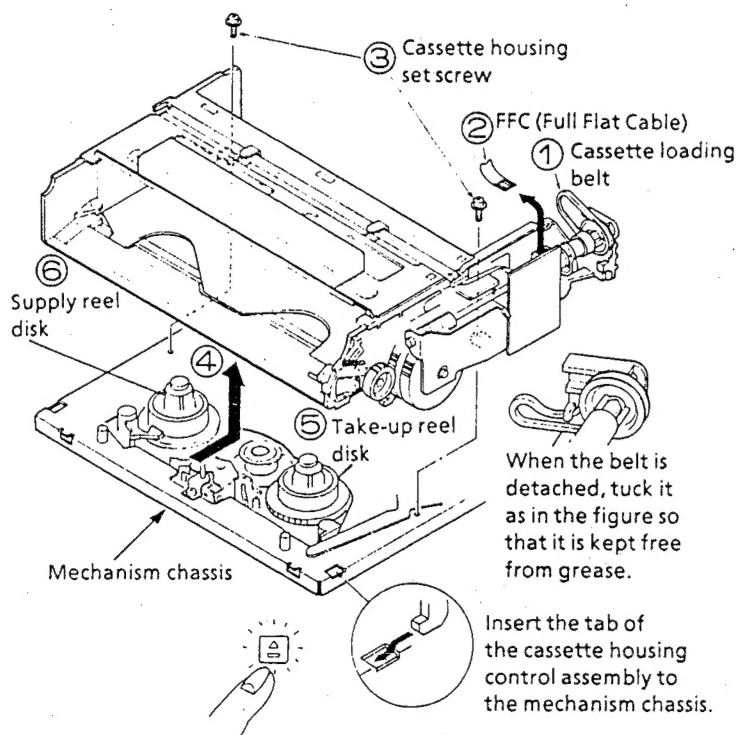


Figure 1-1.

• Reassembly

1. Before installation of the cassette housing control assembly, place the unit in the stop mode with the power on, then unplug the power cord. (The main body is placed in the eject mode.)
2. Follow the procedures for removal in the reverse order.

Notes:

1. Be sure to unplug the power cord in removal and reassembly.
2. Keep the cassette loading belt free from grease. In case of its adhesion, clean the belt.
3. In using a magnet screw driver, be sure to keep it away from the A/C head, FE (Full Erase) head, or the drum.

REPLACEMENT OF WORM WHEEL ASSEMBLY

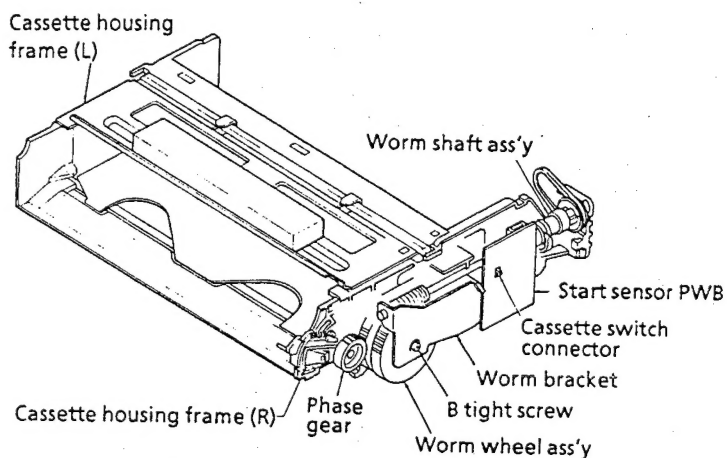


Figure 1-2.

● Removal

1. Unsolder the cassette switch connectors (No. 16, 17) from the start sensor PWB.

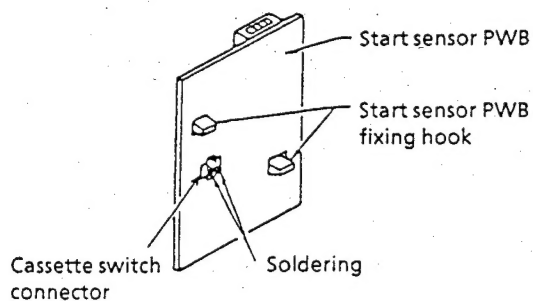


Figure 1-3.

2. Lift the start sensor PWB pressing the two start sensor PWB fixing hooks inward.

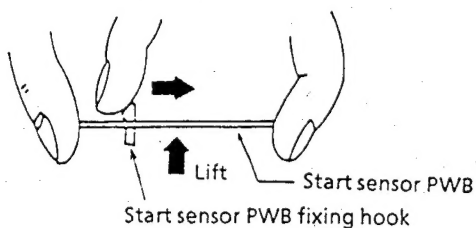


Figure 1-4.

3. Unscrew one B tight screw to detach the worm bracket.

Note:

The worm shaft bearing can easily come out of position. So be careful not to lose it.

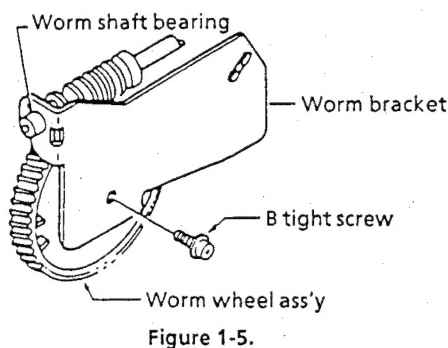


Figure 1-5.

4. Remove the worm shaft assembly, pulley, and cassette loading belt all from the cassette housing frame (R).

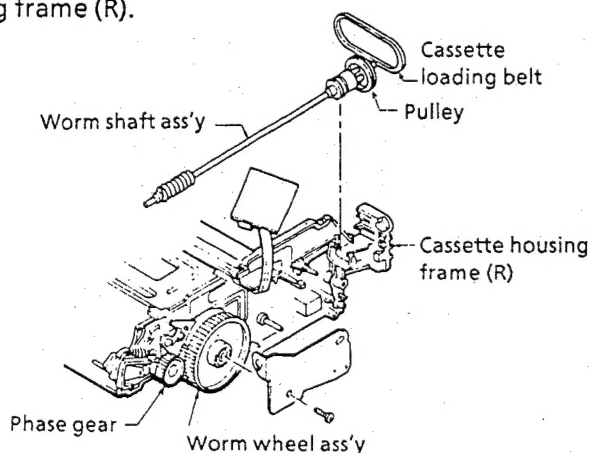


Figure 1-6.

5. Place the slider pin just above the worm wheel assembly (Figure 1-7). (The retainer of the slider is locked at two positions. So unlock it as in the Figure 1-8.)

6. Pull out the worm wheel assembly toward you pressing the switch lever upward. (Figure 1-7)

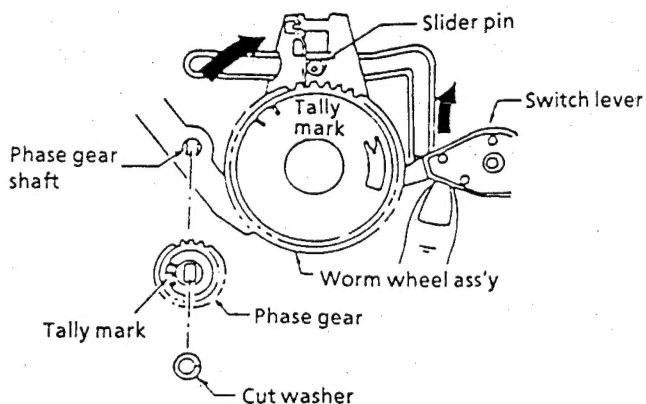


Figure 1-7.

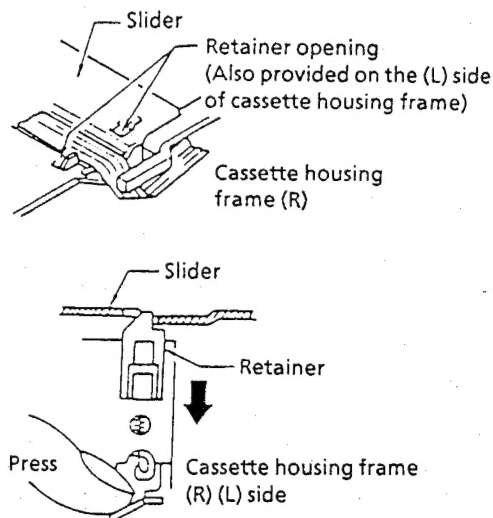


Figure 1-8.

● Reassembly

1. Turn the phase gear clockwise until the slider comes to a halt in the cassette insertion direction. (See the Figure 1-9.)
2. Insert the set up worm wheel gear assembly into the cassette housing frame (R), matching the mark on the phase gear with the mark on the worm wheel gear. Detach the cut washer on the phase gear assembly and the phase gear for easier installation of worm wheel assembly.

Note:

Make sure that the slider pin is in the groove of the drive gear arm.

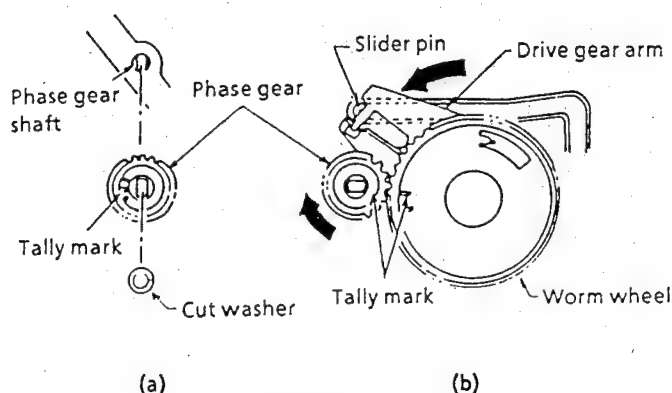


Figure 1-9.

3. Install the pulley and the cassette loading belt on the worm shaft assembly. Couple the clutch to the clutch lever. And mount them together in the cassette housing frame (R).

Note:

Keep in mind that the clutch switching lever should be in the correct position. The mechanism might malfunction if the lever is slightly out of position. (See page 12.)

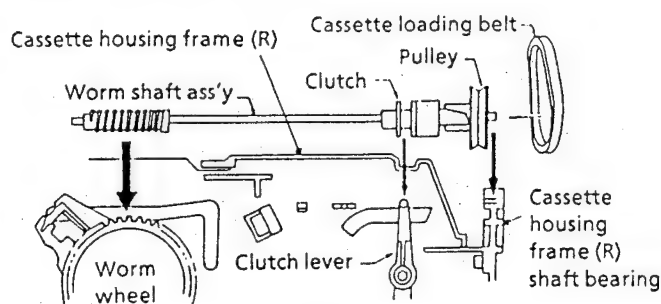


Figure 1-10.

4. Attach the worm bracket to the worm shaft assembly. Place them onto the boss on the cassette housing frame (R).

Note:

Insert ① before screwing into ② and ③.

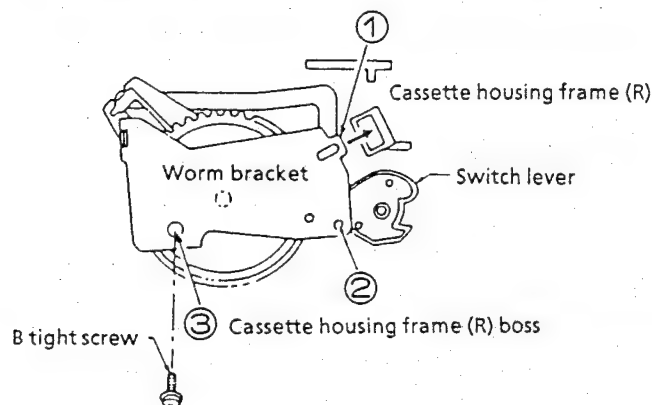


Figure 1-11.

5. Tighten one B tight screw.

Note:

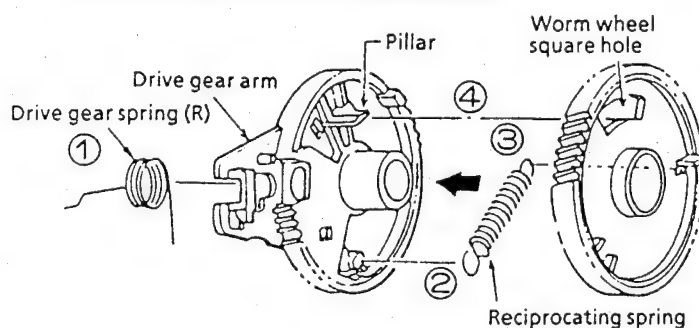
Do not overtighten the B tight screw (no more than 5.0 ± 0.5 kg.cm), because the lower threads of the screw hole at the resin-made boss can be broken.

6. Place the start sensor PWB on the cassette housing frame (R).

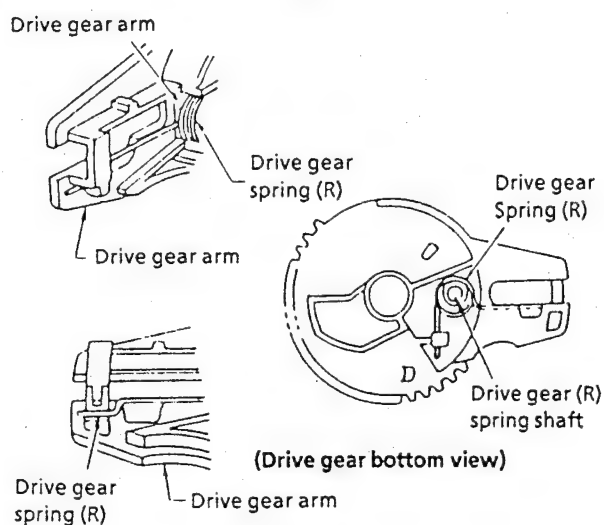
Note:

Check that the switch connectors (No. 16, 17) are in the cassette switch mounting hole.

7. Finally resolder the cassette switch connector to the start sensor PWB.

REASSEMBLY OF DRIVE GEAR

(a)



(b)

Figure 1-12.

1. Pass the tip of the drive gear spring (R) ① through the square hole of the drive gear (R) to hook the spring in position.
2. Hook one end ② of the reciprocating spring to the catch of the drive gear (R).
3. Hook the other end ③ of the reciprocating spring to the catch of the worm wheel.
4. Insert the pillar ④ of the drive gear (R) into the square hole of the worm wheel. Turn the worm wheel somewhat counterclockwise for insertion of the worm wheel to the drive gear (R), because the reciprocating spring is at work.

REPLACEMENT OF CASSETTE LOADING BELT

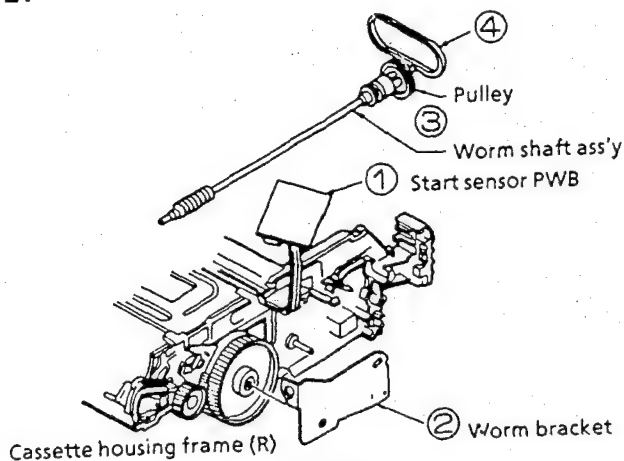


Figure 1-13.

1. Remove the start sensor PWB ① and worm bracket ② from the cassette housing frame (R).
2. Remove the worm shaft assembly ③.
3. Replace the cassette loading belt ④ with a new one.

Notes:

1. Do not overtighten the B tight screw which holds the worm bracket in position. The specified torque is $5.0 \pm 0.5 \text{ kg.cm}$.
2. Make sure that the cassette loading belt is free from grease. If stained with grease, clean the belt with the cleaning liquid.
3. Perform checking of the clutch switch lever for proper action.

CHECKING THE CLUTCH SWITCH LEVER

• Checking

Place the mechanism in the cassette eject mode when removing and attaching the cassette housing from and to the mechanism chassis. Make sure enough that each part in the cassette housing such as the clutch switch lever is in position. If not, it causes malfunction.

Note:

Figure 1-14 shows the position of each part in the cassette eject mode.

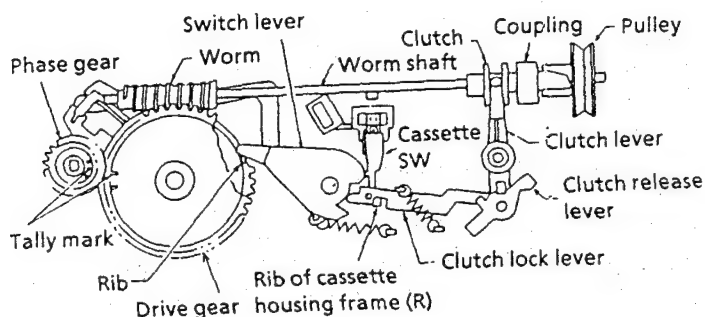
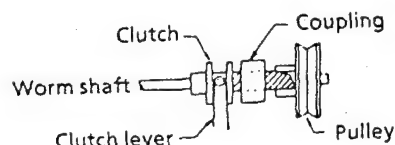


Figure 1-14.

1. First make sure that the tip of the switch lever is held at the rib of the drive gear (R).
2. Check that the rib of the cassette housing frame (R) and the concavity of the clutch lock lever are engaged.
3. Finally be sure that the relationship between the clutch lever and the clutch, as well as between the clutch and the pulley, are correct as in the Figure 1-15.



Check that the clutch is engaged with the pulley through the coupling.

Figure 1-15.

• Resetting

Take the following steps to reset the clutch if it is unlocked or if the switch lever and the clutch lock lever are unlocked.

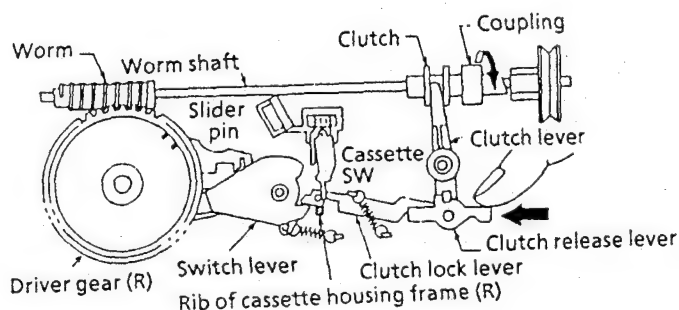


Figure 1-16.

1. Shift the slider by turning the coupling in the arrow direction (clockwise) until the slider pin is at the bottom of the slider groove as shown in the Figure 1-16. (The loading mode)

Note:

Note that the slider is equipped with a lock mechanism. Unlock the locks on cassette housing frames (L) and (R) side before shifting the slider.

2. When the position is set as shown in the Figure 1-16, push the clutch release lever in the direction of the arrow by hand until the clutch lock lever becomes tightly locked by the rib of the cassette housing frame (R).
3. Then turn the coupling counterclockwise until the slider reaches the cassette insertion opening and the reciprocating spring is activated.

Note:

There is no need to unlock the slider when shifting the slider to the cassette insertion opening. Just keep shifting the slider.

REPLACEMENT OF LOCK RELEASE LEVER

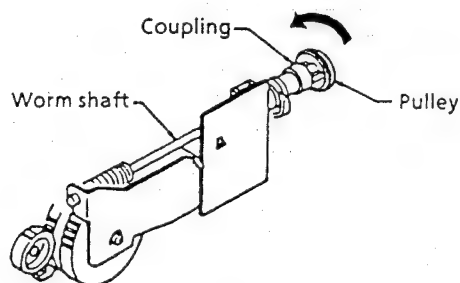
• Removal

1. Place the slider in the cassette down position. (Turn the coupling on the worm shaft clockwise until the slider is in the cassette down position.)

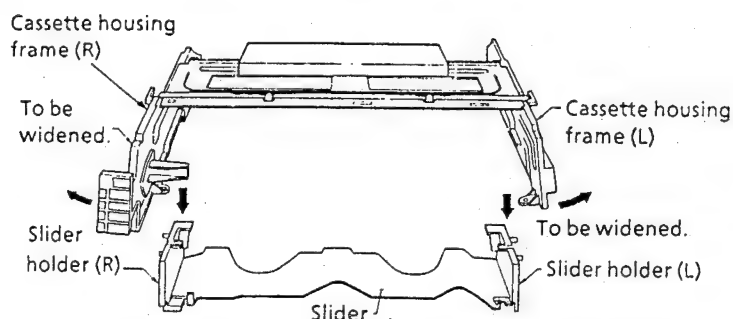
Note:

Before shifting, unlock the slider.

2. Slightly widen the cassette housing frames (R) and (L) to unhook the slider holders (R) and (L) of the slider assembly off the grooves of the cassette housing frames.



(a)



(b)

Figure 1-17.

3. Lift the slider holder (R) upward about 2mm off the slider by pressing two catches with a thin tip screw driver. Take care not to damage the catches.

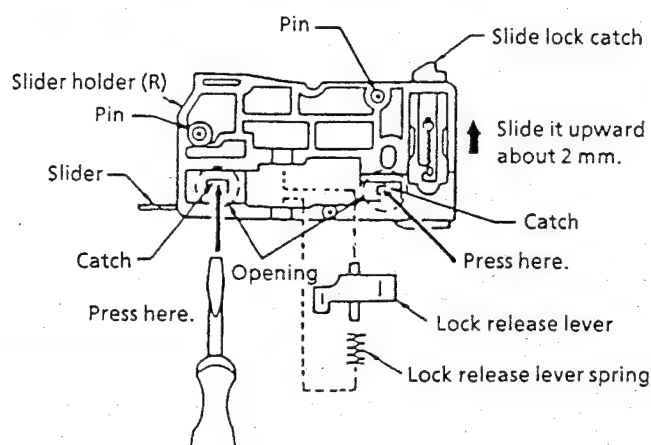


Figure 1-18.

4. Remove the lock release lever from the slider holder (R).

• Reassembly

1. Follow the steps for removal in the reverse order. (See Figures 1-17 and 1-18.)
2. Attach the lock release lever to the slider holder (R).
3. Slide the slider holder (R) downward so that the two catches of the slider holder (R) fit the opening of the slider.
4. Slightly widen the cassette housing frames, and set the pins of slider holders (R) and (L) into the grooves of the cassette housing frames.

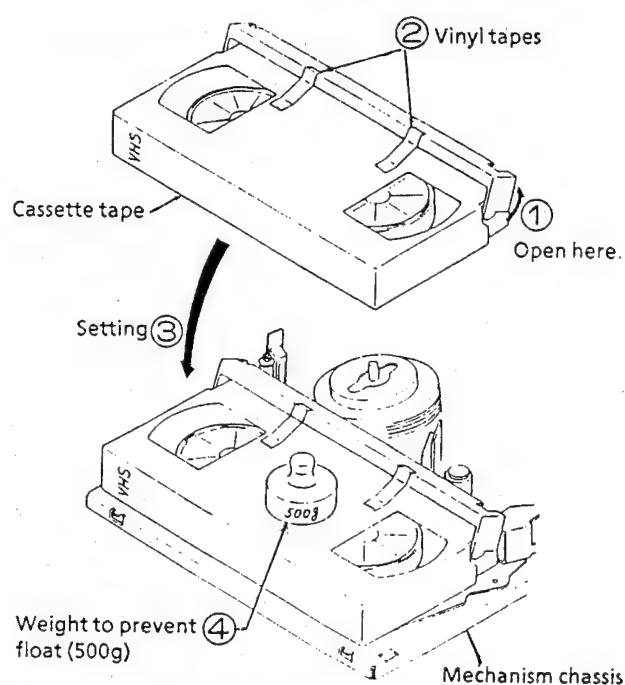
Note:

Check if the pins of the slider holders (R) and (L) fit the grooves of the cassette housing frames, and if the drive gear arm is sufficiently engaged with the slider holders.

5. Turn the coupling counterclockwise until the slider is at the cassette insertion opening.

TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Plug in the power cord.
2. Turn on the power switch.
3. Open the lid ① of a cassette tape by hand.
4. Hold the lid with two pieces of vinyl tape ②.
5. Set the cassette tape in the mechanism chassis.
6. Weight the cassette tape with a weight ④ to prevent floating.
7. Perform running test.



Note:

The weight should not be more than 500 g.

Figure 1-19.

REPLACEMENT AND HEIGHT CHECKING AND ADJUSTMENT OF REEL DISKS

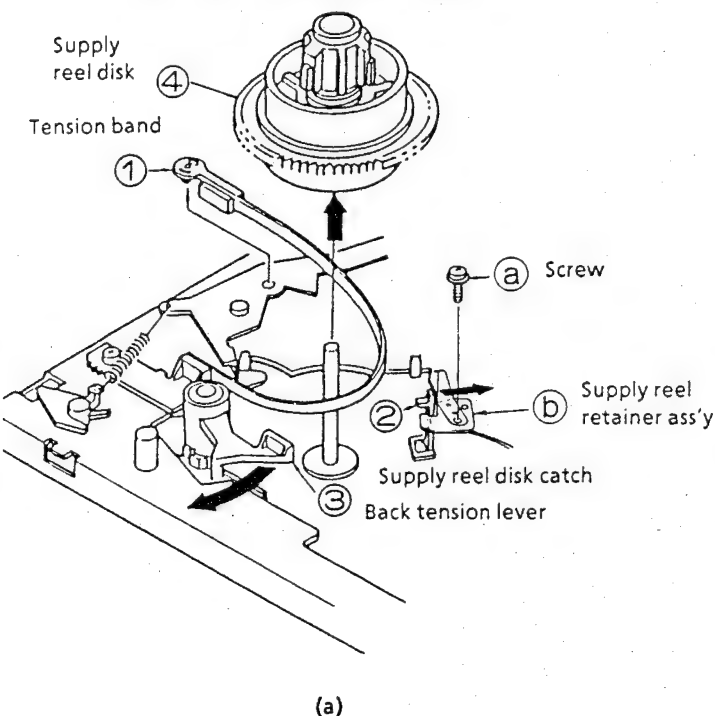
1. Remove the cassette housing control assembly.
2. Set the mechanism in the playback mode with no cassette tape in place. Unplug the power cord.
3. Set the idler gear in the center (neutral).

• Removal (Supply reel disk)

1. Remove the tension band ①. (Take care not to deform it.)
2. Unscrew the screw ② and remove the supply reel retainer assembly ③.
3. Release the supply reel disk catch ④ and back tension lever ⑤.
4. Pull the supply reel disk upward.

Note:

1. Take care not to deform the tension band.
2. Check and adjust the tension pole position. (See page 19.)
3. Be careful not to damage the gear and the idler gear on the supply reel disk.
4. Press the tension band in the direction of the arrow for removal (See Figure 1-20(b)).



Note:

When the tension band is pressed in the direction of the arrow for removal, the catch is hard to be deformed.



(b)
Figure 1-20.

• Removal (Take-up reel disk)

1. Unscrew the screw ① and remove the take-up reel retainer.
2. Release the take-up reel disk catch ②.
3. Pull the take-up reel disk ③ upward.

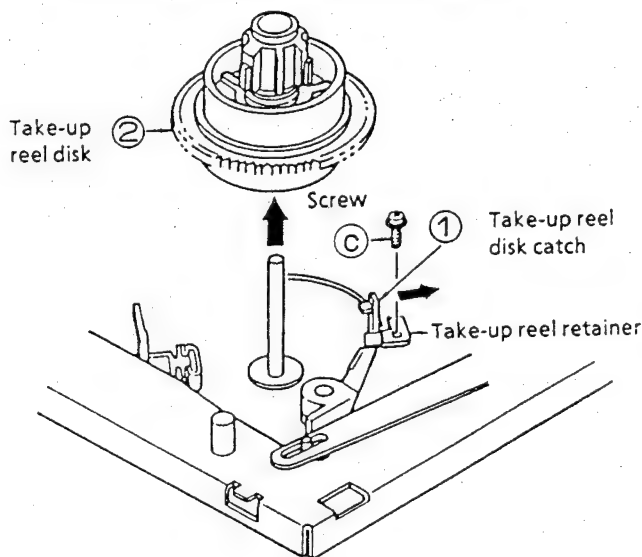


Figure 1-21.

• Reassembly (Supply reel disk)

1. Clean the reel disk shaft ① and apply oil to it.
2. Release the supply reel disk catch ② and back tension lever ③.
3. Install a new supply reel disk ④ onto the shaft.
4. Replace the tension band ⑤ around the supply reel disk, and insert it to the hole of the tension arm.
5. Replace the supply reel retainer assembly ⑥ in place, and tighten up the screw ⑦.

Note:

1. Take enough care not to deform the tension band during installation of the supply reel disk.
2. Be careful not to damage the supply reel disk gear, back tension lever, supply reel disk catch, or the like with tools.

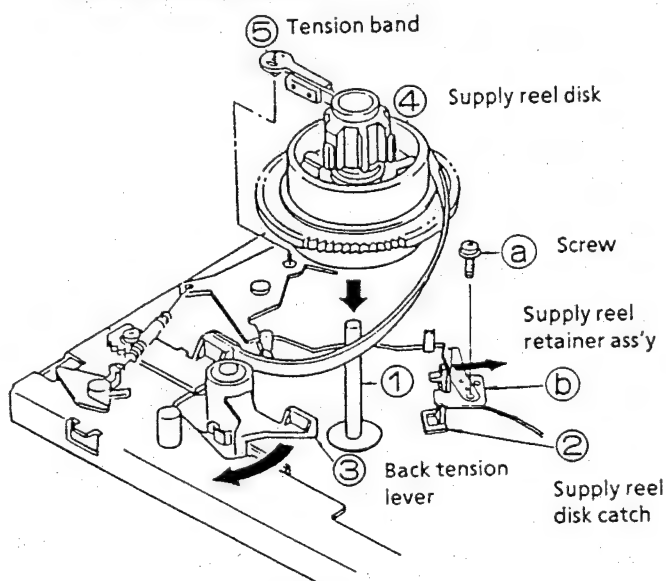


Figure 1-22.

● Reassembly (Take-up reel disk)

1. Clean the reel disk shaft ① and apply oil to it.
2. Release the take-up reel catch ② and video search brake lever ③.
3. Install a new take-up reel disk ④ onto the shaft.
4. Replace the take-up reel retainer ⑤ in position and tighten up the screw ⑥.

Note:

Take care not to damage the video search brake lever.

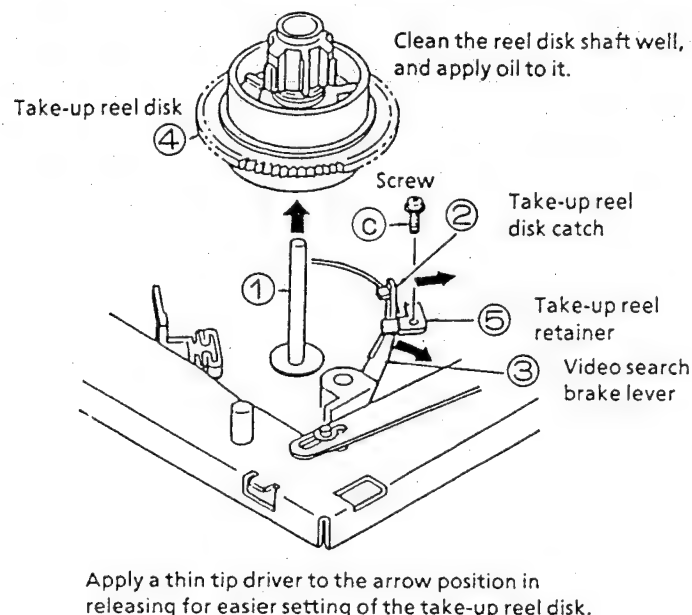


Figure 1-23.

- * After reassembly, check the video search rewind back tension (see page 18), and check the brake torque (see page 20).

● Height checking and adjustment

Note:

Place the master plane onto the mechanism unit, taking care not to hit the drum (see Figure 1-24).

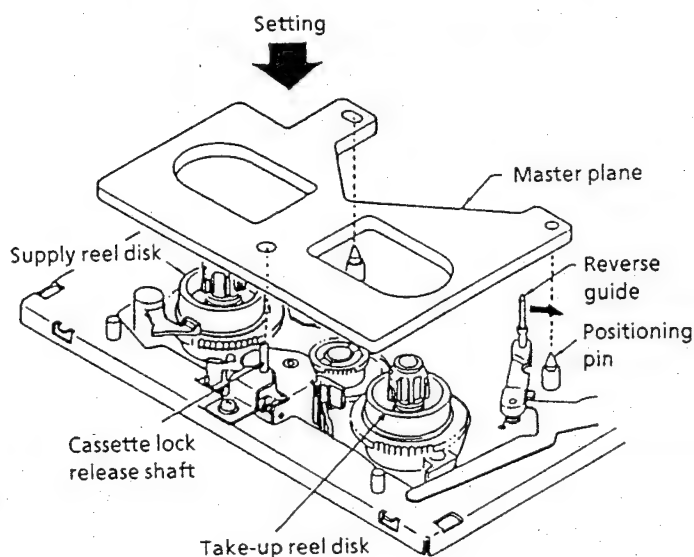


Figure 1-24.

1. For height adjustment, press the reel disk with a finger, and turn it right and left with a screwdriver (see Figure 1-26 (a)).

Set the master plane releasing the reverse guide by a finger.

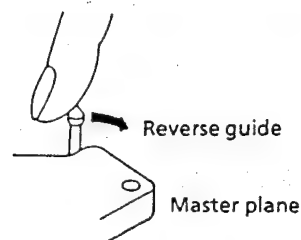
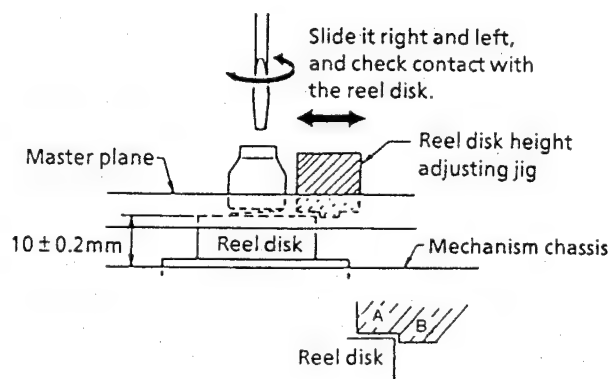
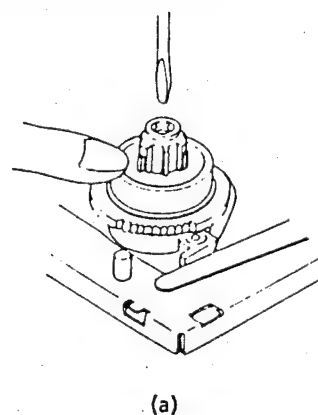


Figure 1-25.

2. Check that the reel disk is lower than part A but higher than part B. If the height is not correct, adjust the height adjusting screw (see Figure 1-26 (b)).

Note:

Whenever replacing the reel disk, perform the height checking and adjustment.



(b)

Figure 1-26.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

- Remove the cassette housing control assembly.
- Setting

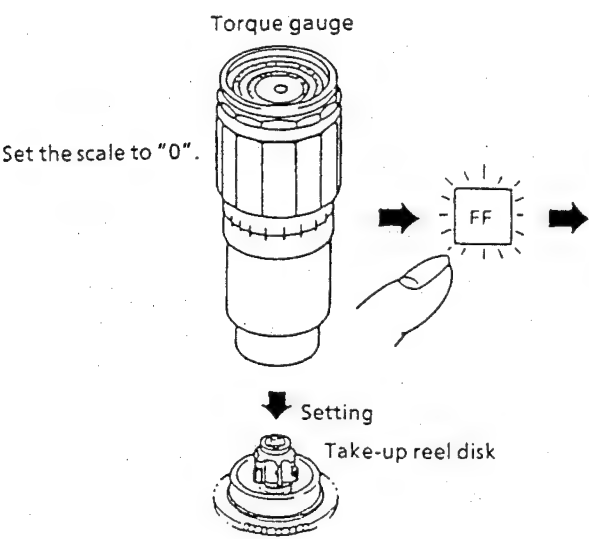


Figure 1-27.

• Checking

Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction

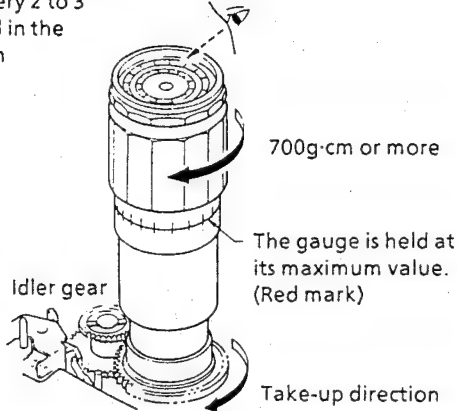


Figure 1-28.

• Adjustment

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

Note:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- Remove the cassette housing control assembly.
- Setting

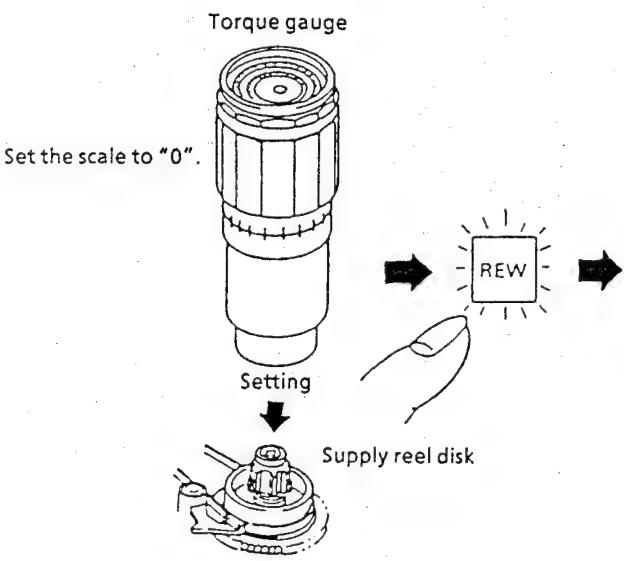


Figure 1-29.

• Checking

Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction

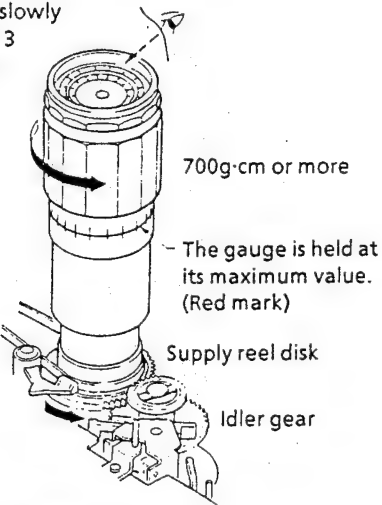


Figure 1-30.

• Adjustment

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

Note:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN PLAYBACK MODE

1. Remove the cassette housing control assembly.
2. Open the lid of the cassette torque meter, and hold it with pieces of vinyl tapes.

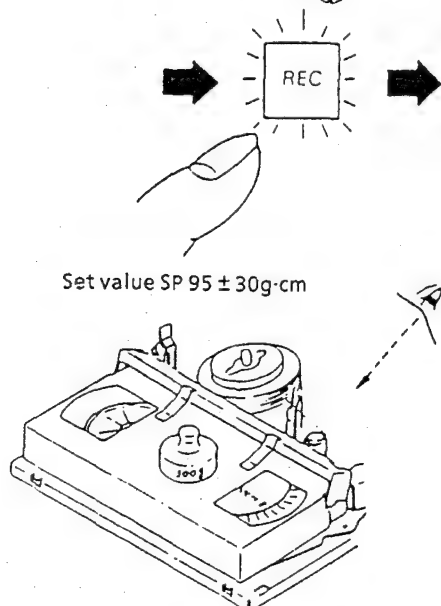
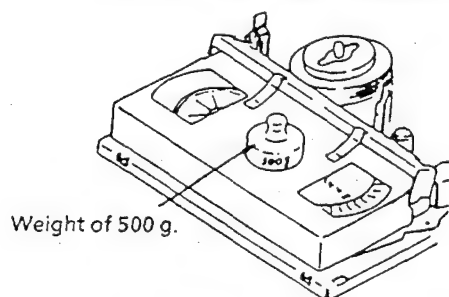
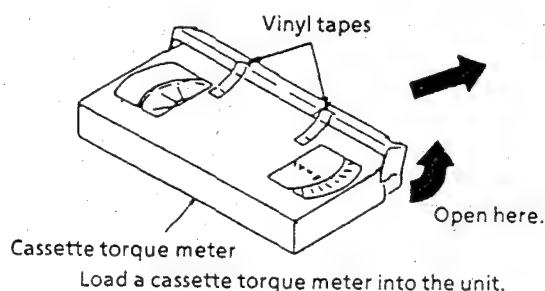


Figure 1-31.

• Checking

1. Check that the torque is in the range of 95 ± 30 g·cm.
2. The torque fluctuates due to the rotational deviation of the reel drive unit. Use the center of the fluctuation as the value.
3. Place the unit in the SP record mode, and check that the take-up torque is within the range.

• Adjustment

If the take-up torque in the playback mode is outside the range, replace the take-up reel disk.

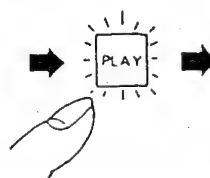
Note:

Weight the cassette torque meter to prevent floating.

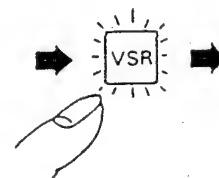
CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- Remove the cassette housing control assembly.

• Checking



Push the play button to place the unit in the playback mode.



Push the video search rewind button to place the unit in the video search rewind mode.

Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value 170 ± 40 g·cm

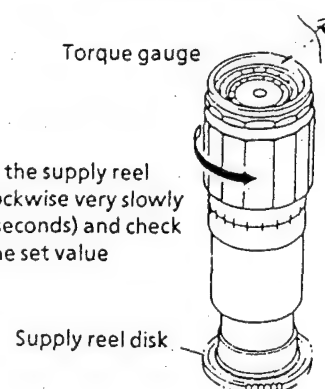


Figure 1-32.

Note:

Set the torque gauge securely on the supply reel disk. If it is not secure, the measurement will be incorrect.

• Adjustment

If the take-up torque in video search rewind mode is outside the range, replace the supply reel disk.

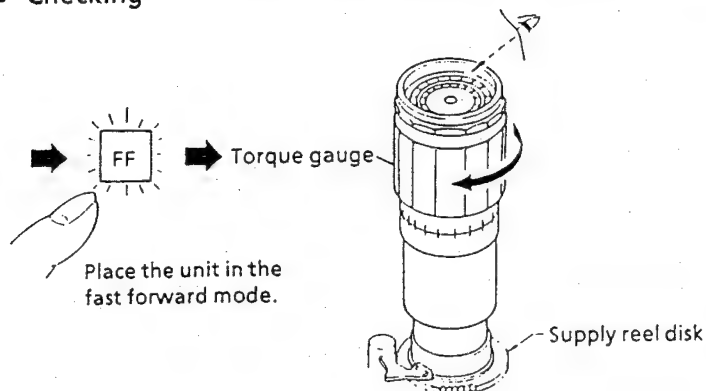
Note:

The torque fluctuates due to the rotational deviation of the supply reel disk. Use the center of the fluctuation at the value.

CHECKING THE FAST FORWARD BACK TENSION

- Remove the cassette housing control assembly.

- Checking



Place the torque gauge on the supply reel disk, and turn it clockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within $15 \pm 5 \text{ g}\cdot\text{cm}$

Figure 1-33.

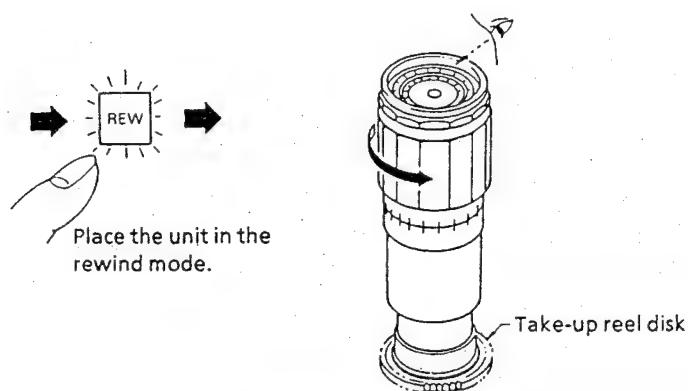
Note:

Set the torque gauge securely on the supply reel disk. If the torque gauge is not securely set on the reel disk, measurement will be incorrect.

CHECKING THE REWIND BACK TENSION

- Remove the cassette housing control assembly.

- Checking



Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within $15 \pm 5 \text{ g}\cdot\text{cm}$.

Figure 1-34.

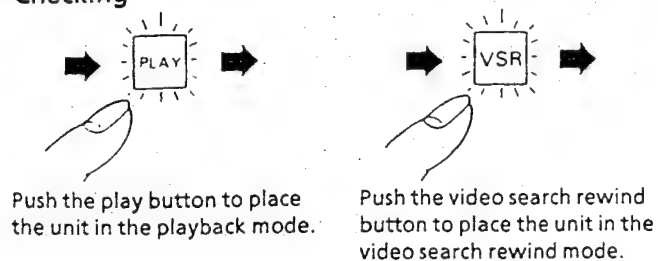
Note:

Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.

CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- Remove the cassette housing control assembly.

- Checking



Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value $45 \pm 20 \text{ g}\cdot\text{cm}$.

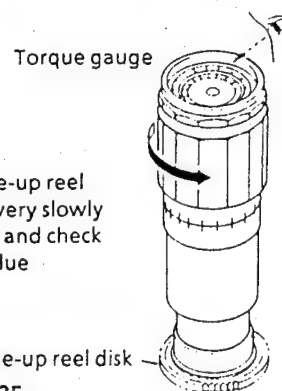


Figure 1-35.

Note:

Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.

CHECKING THE PINCH ROLLER PRESSURE

- Remove the cassette housing control assembly.

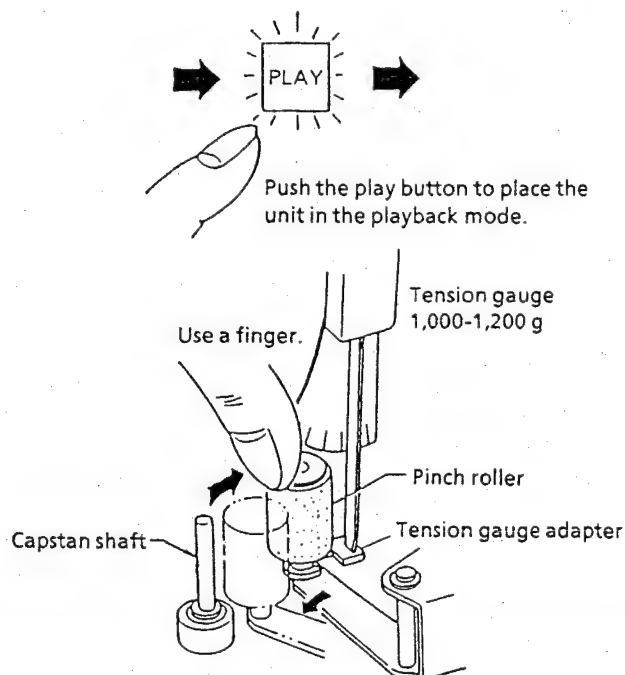


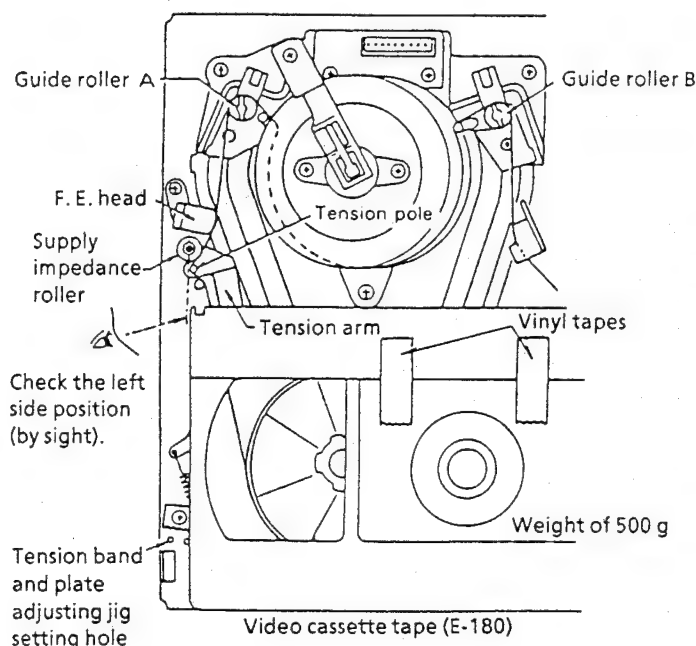
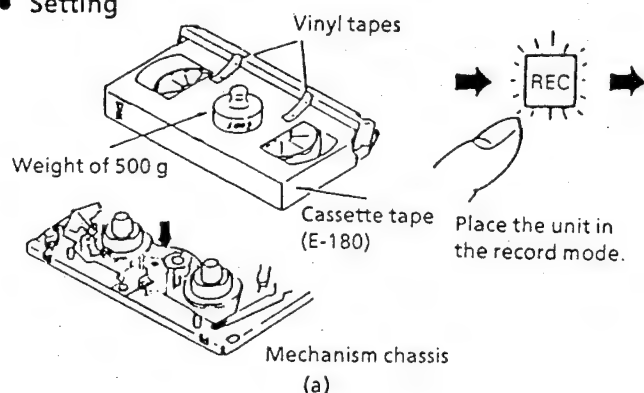
Figure 1-36.

1. Detach the pinch roller from the capstan shaft.
2. Set the tension gauge by hooking the tension gauge adapter onto the pinch roller shaft.
3. Gradually release the pressure to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
4. Check that the reading of the tension gauge is in the range of 1000 to 1200 g.

CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

- Remove the cassette housing control assembly.

- Setting



(b)
Figure 1-37.

- Checking

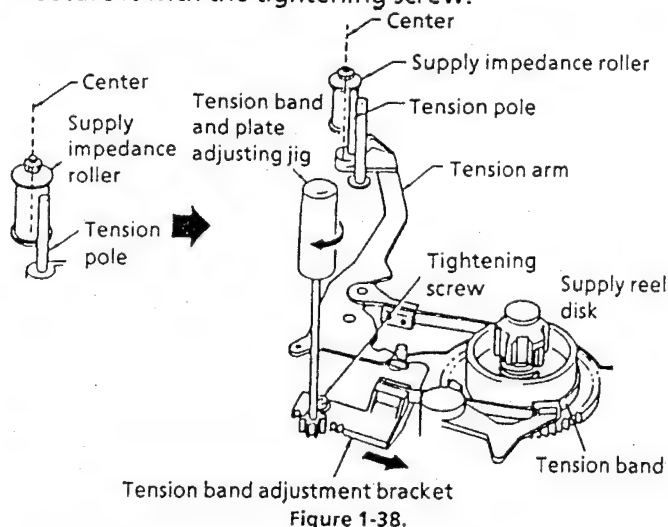
1. The guide rollers (A, B) operate to bring the tape outside the cassette tape and simultaneously the tension pole moves to the left, loading the tape. At that time (loading completed), check the position of the tension pole.

2. At the beginning of the tape (E-180), check that the tension pole's left side is aligned with the supply impedance roller's center by sight.
3. Check that the end of the tape is neither curled against the flange of the supply impedance roller nor over it.
4. During the video search rewind mode with no cassette tape in place, check that the supply reel disk is free from the tension band.

- Position adjustment (record mode)

When the tension pole is at the right of the supply impedance roller's center:

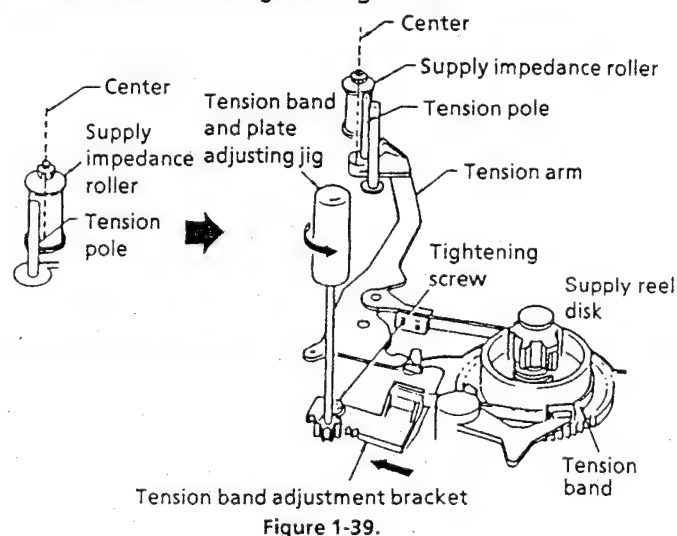
Untighten the tightening screw, and shift the tension band adjustment bracket in the direction of the arrow using a tension band and plate adjusting jig until it is in the set value range (center). Then secure it with the tightening screw.



- Position adjustment (record mode)

When the tension pole is at the left of the supply impedance roller's center:

Untighten the tightening screw, and shift the tension band adjustment bracket in the direction of the arrow using a tension band and plate adjusting jig until it is in the set value range (center). Then secure it with the tightening screw.



CHECKING AND ADJUSTMENT OF RECORD / PLAYBACK BACK TENSION

- Remove the cassette housing control assembly.

- Checking

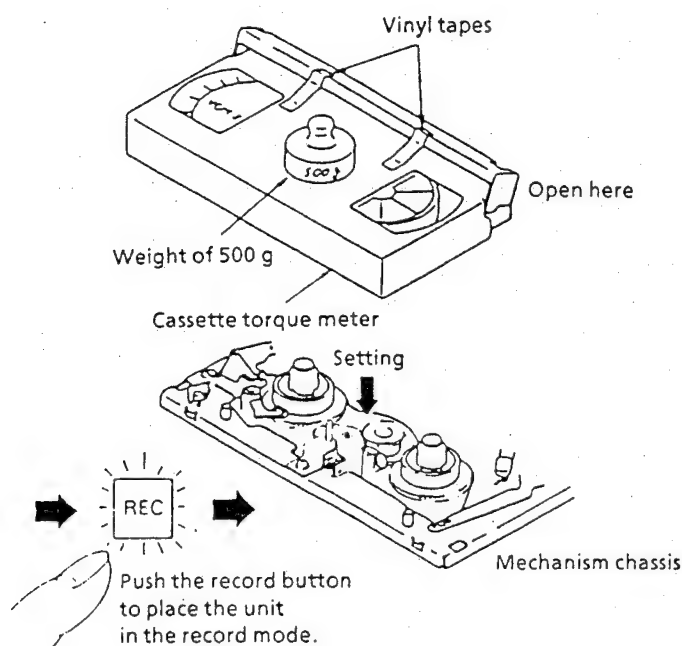


Figure 1-40.

- Put a cassette torque meter into the unit.
- Push the record button to place the unit in the record mode.
- Check that the back tension indicated by the gauge is within the set range 31 to 36 g·cm.

Note:

- Make sure that the video cassette tape is over the retaining guide.
- Make sure that the tape is not slack nor damaged at either end.

- Adjustment

- If the reading of the cassette torque meter is less than specified, move the tip of the tension spring hook plate toward the hole A.
- If the reading of the cassette torque meter is more than specified, move the tip of the tension spring hook plate toward the hole B.

Note:

Put a thin screw driver (–) in the shaft hole, lean it toward you, and turn it for easier shift of the tension spring hook plate in the direction of A or B.

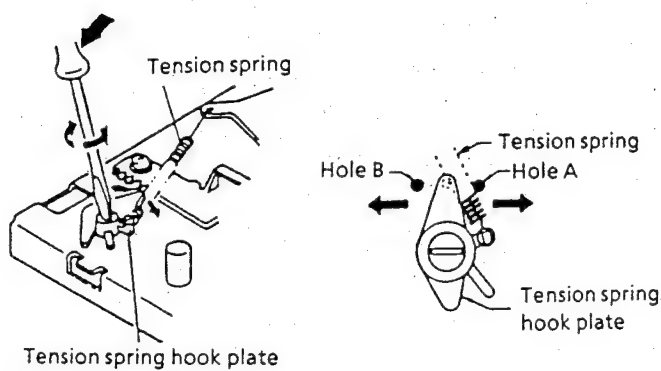


Figure 1-41.

CHECKING THE BRAKE TORQUE

- Checking the brake torque at the supply side

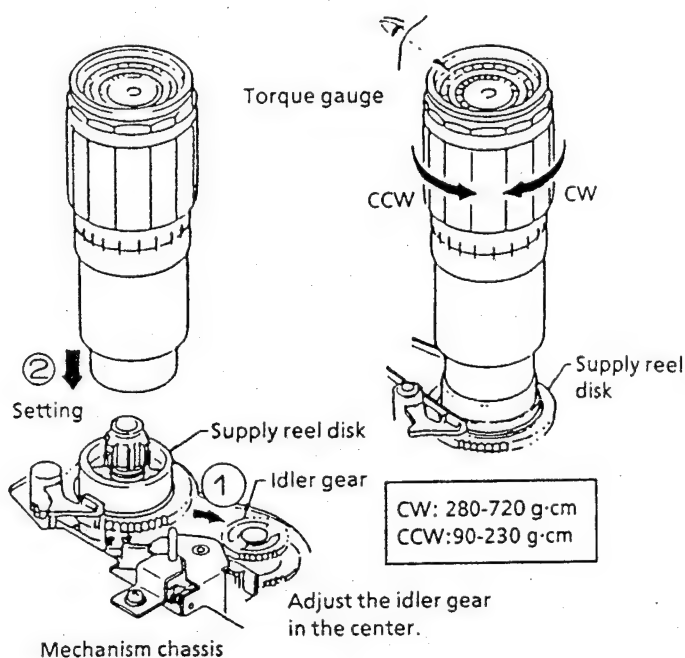


Figure 1-42.

- Remove the cassette housing control assembly.
- Place the mechanism in the stop mode by unplugging the power cord in the fast forward or rewind mode.
- Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the supply brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CW direction = 280 to 720 g·cm, CCW direction = 90 to 230 g·cm, and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.

● Checking the brake torque at the take-up side

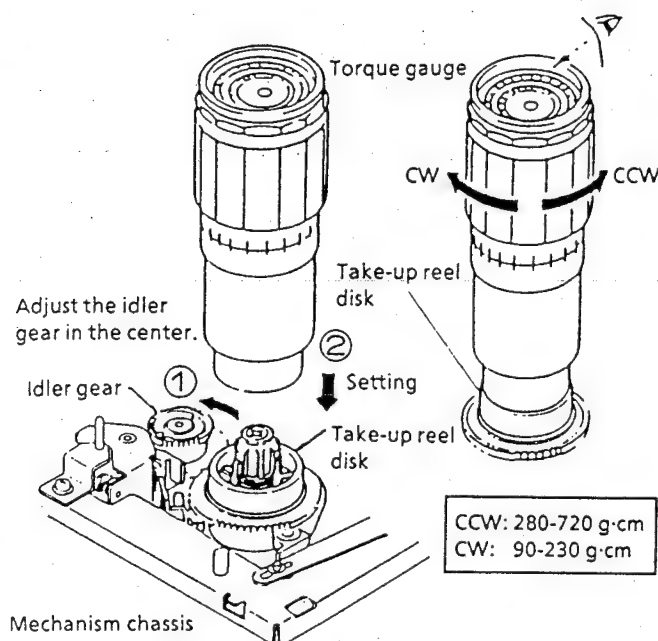


Figure 1-43.

1. Remove the cassette housing control assembly.
2. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the take-up brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CCW direction = 280 to 720 g·cm, CW direction = 90 to 230 g·cm, and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

● Adjustment of the brake torque at the supply side and the take-up side

1. If the supply or take-up brake torque is outside the range, clean the supply or take-up reel disk break lever felt, then recheck the torque.
2. If the supply or take-up brake torque is still outside the range, replace the main brake or the main brake spring.

REPLACEMENT OF MAIN BRAKE

1. Remove the reel belt and the reel block FFC (Full Flat Cable).
2. Remove the cut washer ① off the brake shifter.
3. Unscrew the four screws ② and then the take-up reel retainer.
4. Remove the reel block assembly ④ downward.
5. Remove the cut washer ③ first and then the reel pulley.
6. Unscrew the two screws ④ and detach the idler assembly.
7. Unhook the back tension lever spring ⑤ and remove the back tension lever ⑥. (Undo the hook under the reel chassis.)
8. Open the shifter latch ⑦ and remove the brake shifter assembly ⑧.
9. Release the reel disk catches ⑬ and then remove the left and right reel disk assemblies ⑨ and ⑩.
10. Finally remove the main brake levers ⑪ and the main brake spring ⑫.

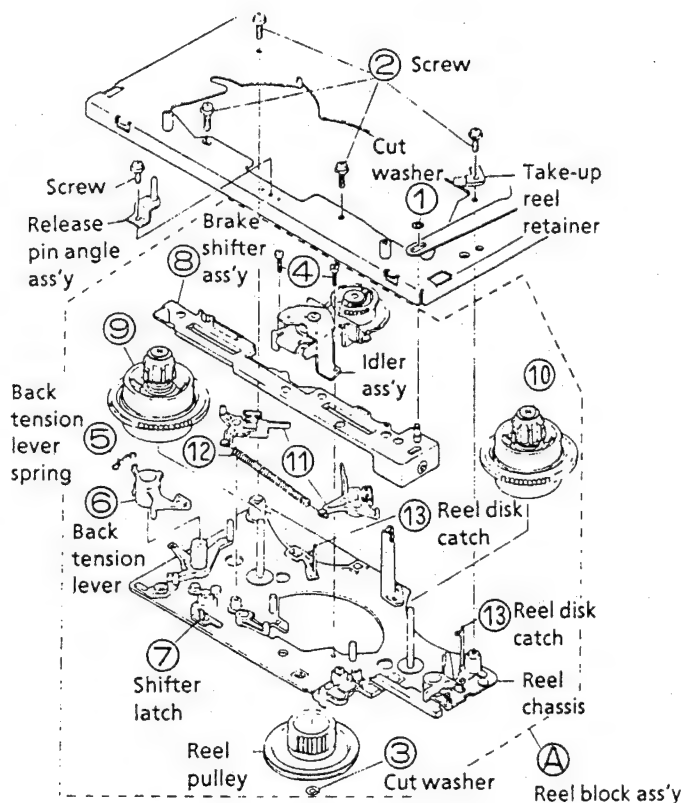


Figure 1-44.

Notes:

When the main brake is replaced, perform the height checking and adjustment (see page 15), and the brake torque checking (see page 20).

REPLACEMENT OF A/C (Audio/Control) HEAD

1. Remove the cassette housing control assembly.
2. Place the unit in the unloading mode, and unplug the power cord.

• Removal

1. Loosen the tilt adjusting screw ①.
2. Remove the azimuth adjusting screw ②.
3. Remove the A/C head screw ③.
4. Unsolder the A/C head PWB soldered to the A/C head assembly.

Notes:

1. After replacement, be sure to perform the adjustment of the tape drive train (see page 24). Under any circumstances, avoid touching the head. Clean the head, if touched with your finger, with alcohol.
2. Take care that the azimuth spring does not fly off when removing the A/C head screw.

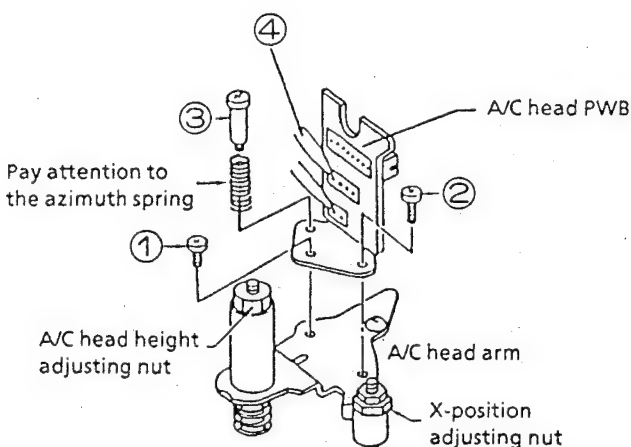


Figure 1-45.

• Replacement

1. Solder the removed A/C head PWB onto a new A/C head assembly.
2. The A/C head assembly is attached so that the A/C head arm and A/C head plate are roughly parallel to each other.

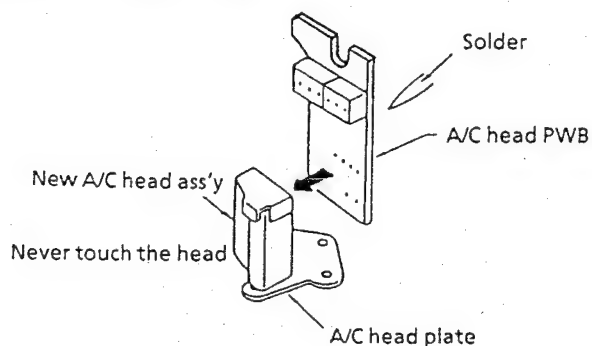


Figure 1-46.

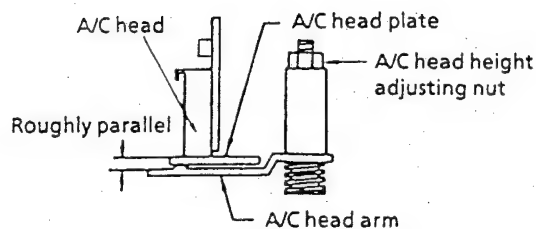
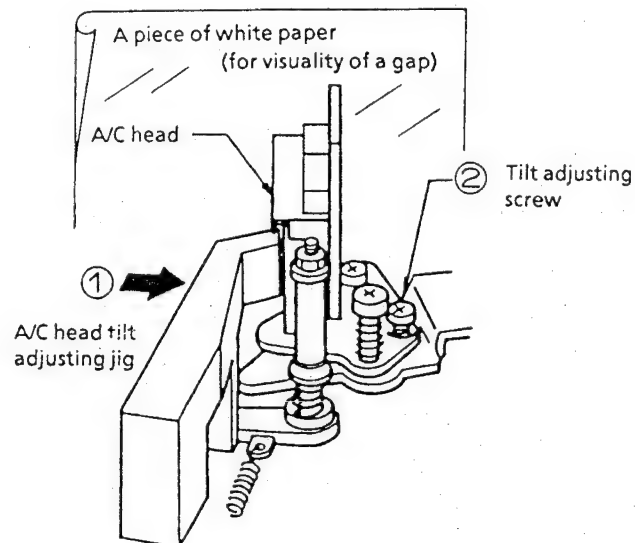


Figure 1-47.

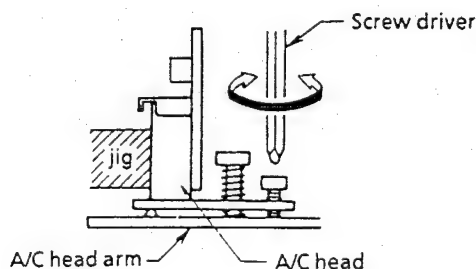
• Adjustment

[A/C head tilt angle]

1. Set the mechanism to the loading mode.
2. Place the A/C head tilt adjusting jig ①.
3. Slowly turn the tilt adjusting screw ② with a screw driver until there is no gap between the jig and the A/C head.



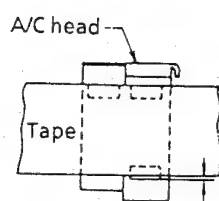
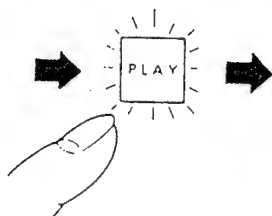
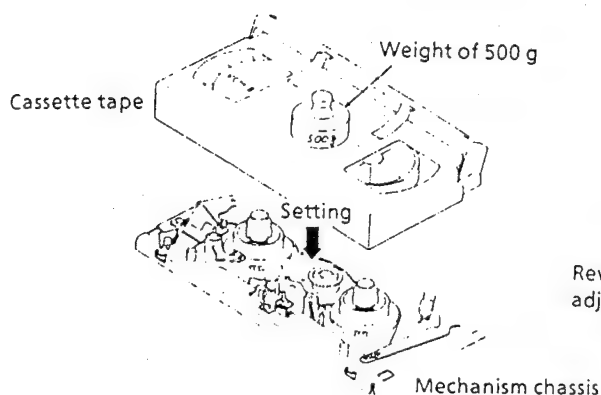
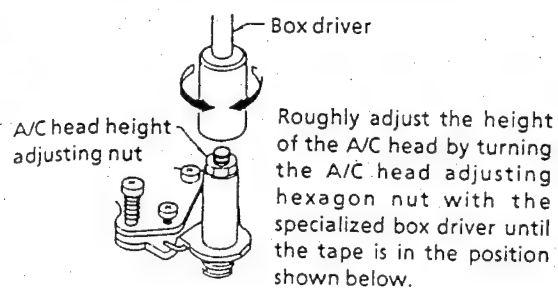
(a)



(b)

Figure 1-48.

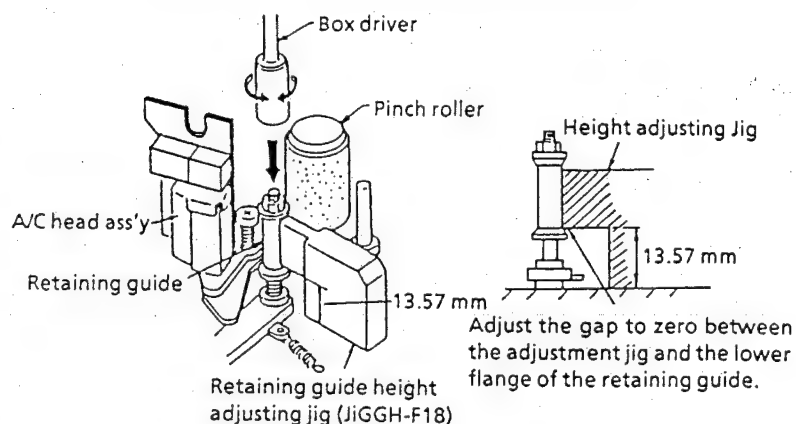
[A/C head height rough adjustment]



Adjust the nut visually so that the control head is visible 0.3 to 0.5 mm below the bottom of the tape.

Figure 1-49.

[Height adjustment of retaining guide]

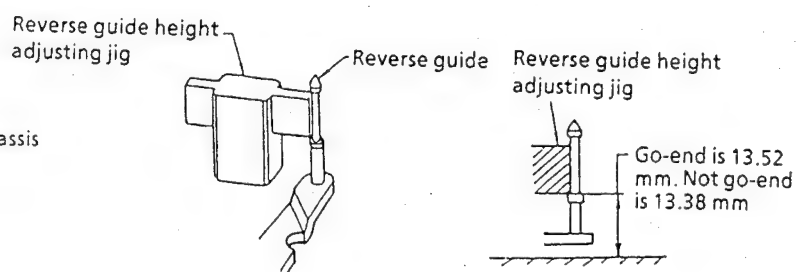


(a)

(b)

Figure 1-50.

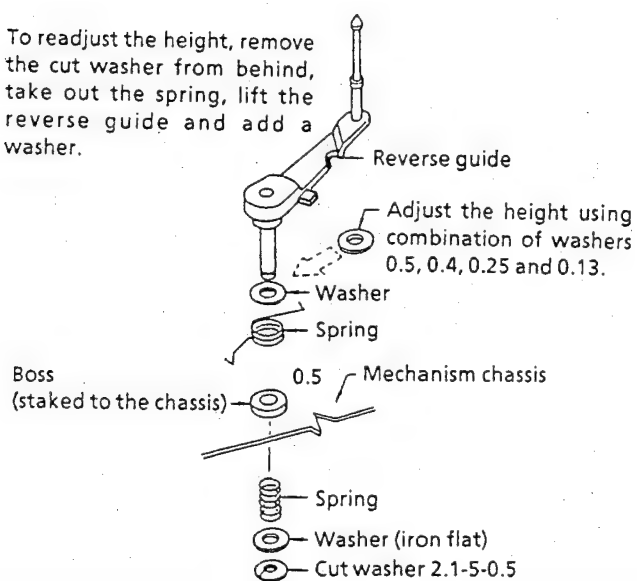
[Height adjustment of reverse guide]



(a)

(b)

To readjust the height, remove the cut washer from behind, take out the spring, lift the reverse guide and add a washer.



(c)

Figure 1-51.

HEIGHT ADJUSTMENT OF RETAINING GUIDE AND REVERSE GUIDE

Notes:

Before the rough adjustment of the tape drive train, check that the retaining guide height is within the value in Figure 1-50 by using the special jigs.

ADJUSTMENT OF TAPE DRIVE TRAIN

1. Remove the cassette housing control assembly.
2. Check and adjust the position of the tension pole. (See page 19.)
3. Check and adjust the video search rewind back tension. (See page 18.)
4. Set the tilt angle of the A/C head. (See page 22.)
5. Rough adjustment of tape drive train.
 - a) Connect the oscilloscope to the test point for PB CHROMA envelope output (TP2201). Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP2202).
 - b) Loosen the setscrew at the lower part of the guide roller, and adjust it with an adjusting screw driver (JIGDRIVERH-4) so that the guide roller turns smoothly. (Do not overloosen the setscrew, which causes insecurity of the guide roller.) (See Figure 1-52.)
 - c) Set the alignment tape (monoscope pattern) on the reel disk, and place the unit in the play-back mode. (Place a 500 g. weight on the cassette tape to prevent floating of the cassette tape.)

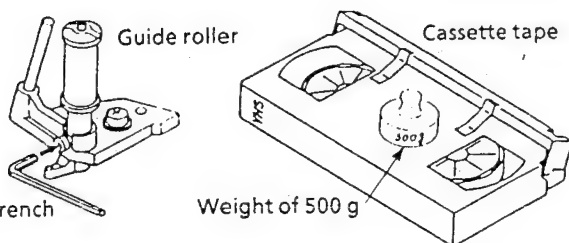


Figure 1-52.

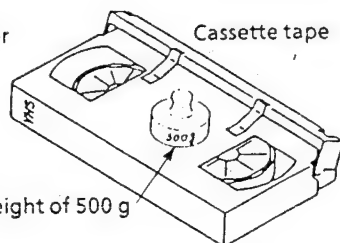
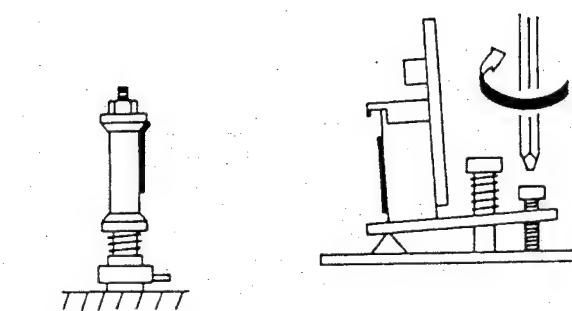


Figure 1-53.

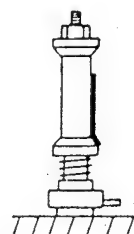
- d) Change the envelope waveform from MAX to MIN, and MIN to MAX by pushing the (+) or (-) tracking button, and check a flat response is obtained on the waveform.
- e) If a flat response cannot be obtained, roughly adjust the guide rollers on the supply side and take-up side using an adjusting screw driver until a flat response can be obtained.
- f) Turn the A/C head tilt adjusting screw with a screwdriver to prevent the tape from wrinkling at the upper and lower flanges of the fixed guide.
 - 1) Wrinkles at the upper flange : Turn the above adjusting screw clockwise, as shown in Fig. 1-54 (a).
 - 2) Wrinkles at the lower flange : Turn the above adjusting screw counterclockwise, as shown in Fig. 1-54 (b).



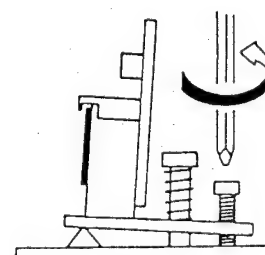
Wrinkles at upper flange

(a)

Clockwise



Wrinkles at lower flange



Counterclockwise

(b)

Figure 1-54.

Notes:

1. Place the tracking control in the center position, and adjust the X-position adjusting nut so that the PB CHROMA envelop becomes maximum for easier rough adjustment of the tape drive train.
2. In the rough adjustment, pay particular attention to the outlet side.

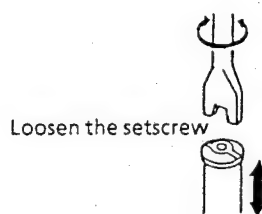


Figure 1-55.

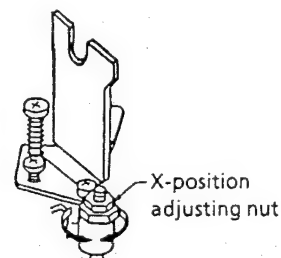


Figure 1-56.

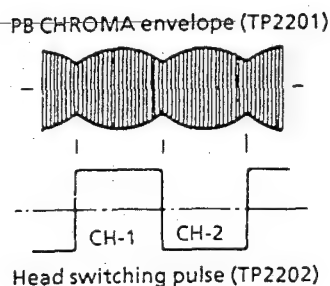


Figure 1-57.

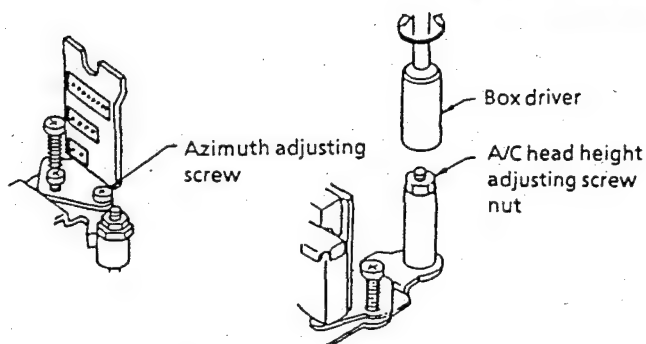


Figure 1-58.

Figure 1-59.

6. Adjustment of A/C head height and azimuth

- Connect an oscilloscope to the audio output terminal.
- Use the alignment tape and play back its audio 6 kHz signal (monoscope pattern for video signal). Adjust the azimuth adjusting screw to obtain the maximum audio output on an oscilloscope. (See Figure 1-58.)
- Use the alignment tape and play back its audio 1 kHz signal (colour bar for video signal) and slowly rotate the A/C head height adjusting nut with the special box driver to obtain the maximum audio output.
- Perform the adjustment in b) again.
- After this adjustment, apply glyptal to the screws and nuts to fix them.

7. Adjustment of tape drive train and X-Position.

- Connect the oscilloscope to the test points (TP2201) for PB CHROMA envelope output. Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP2202).
- Play back the tape drive train alignment tape.
- Push the (+) or (-) button to change the envelope waveform from MAX to MIN, and MIN to MAX. Adjust the guide roller's height on the supply and take-up sides with an adjusting screw driver, to obtain an envelop waveform that is as flat as possible.
- If the tape is above or below the helical lead, the PB CHROMA waveform will take the shape shown in Figure 1-60.
- Adjust for maximum flatness of the envelope as the step 5, e) in page 24.

	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 1-60.

- f) Push the (+) or (-) tracking button to check that a flat response is obtained on the envelope waveform.
 - g) Secure the guide roller by tightening the guide roller setscrew in the unloading mode.
 - h) Play back the tape drive train alignment tape to check that the envelope waveform does not change.
8. Adjustment of A/C head X-position.
- a) Push the (+) and (-) tracking buttons at the same time to the preset mode.
 - b) Rotate the X-position adjusting nut with an adjusting box driver, and adjust the A/C head position for maximum head switching pulse low side envelope.
 - c) Adjust the playback switching point.
 - d) Check the flatness of the envelope waveform and sound by playing back a recorded tape.

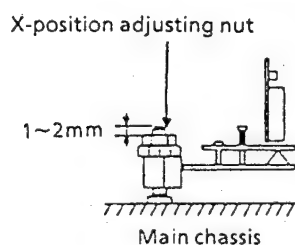


Figure 1-61.

REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- Remove the cassette housing control assembly.
- Removal (Follow the order of indicated numbers.)

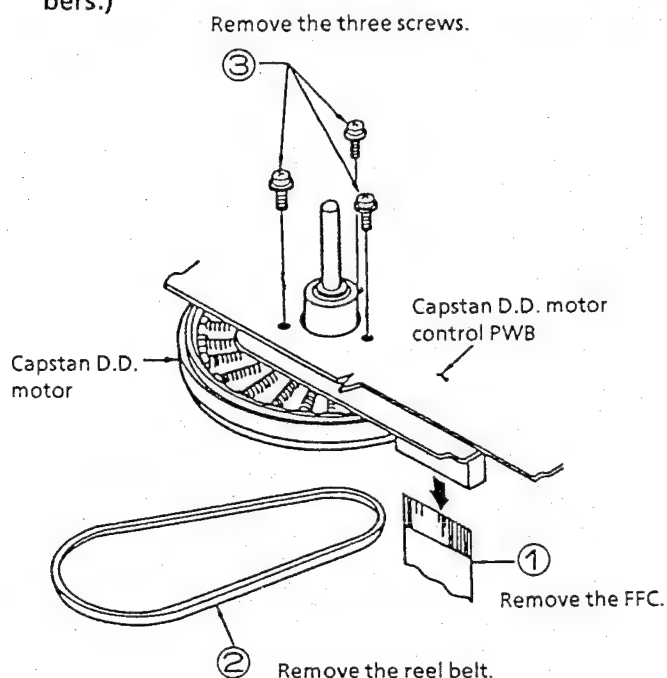


Figure 1-62.

Reassembly

1. Mount the capstan motor on the mechanism chassis making sure not to allow the capstan shaft to hit the mechanism chassis, and attach it with the three screws.
2. Insert the FFC into the capstan D.D. motor control PWB.
3. Attach the reel belt.

Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and check the movement.
2. Check and adjust the servo circuit.

REMOVAL AND REASSEMBLY OF THE LOADING GEAR BLOCK

1. Remove the cassette housing control assembly.
2. Remove the reel belt.
3. Remove the reel block.

Removal

Notes:

1. Use care not to deform the parts hooked to the take-up loading gear and supply loading gear as shown in Figure 1-63.

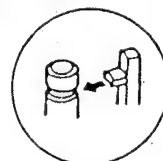


Figure 1-63.

2. In removing the loading gear, secure the guide roller with a rubber band or the like beforehand for easier reassembly.

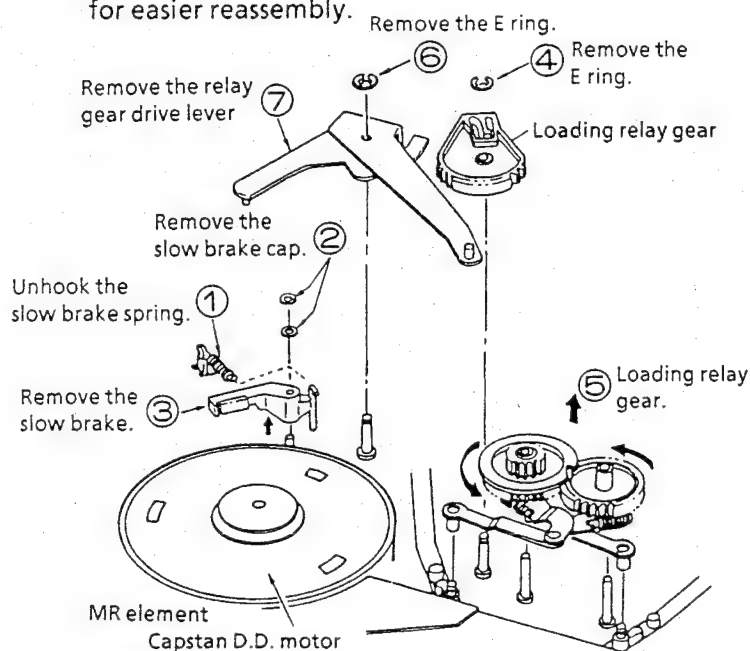


Figure 1-64.

1. Remove the slow brake spring ①.
2. Remove the cut washers ②.
3. Remove the slow brake lever ③.
4. Remove the E ring ④.
5. Rotate the take-up loading gear, take-up loading arm assembly, supply loading gear and supply loading arm assembly slightly in the loading direction, and take them ⑤ all out.
6. Remove the E ring ⑥.
7. Remove the relay gear drive lever ⑦.

● Reassembly

Reverse the procedure. Be sure to match the tally marks on the gears.

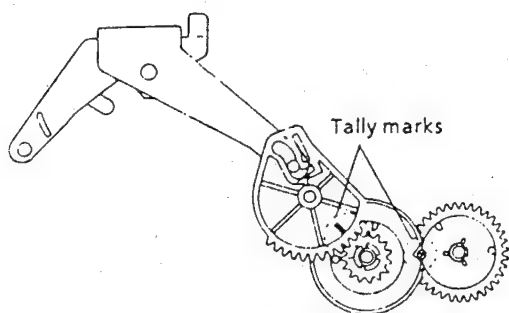


Figure 1-65.

Notes :

1. When reassembling, apply specified grease to the following points; all the gear teeth, all the gear shafts and the cam groove of loading relay gear.
2. Be careful not to deform the supply/take-up loading arms.
3. Be careful to keep clean the slow brake lever felt.
4. Be also careful to keep the outer surface of the capstan D.D. motor free from dust and dirt. (If stained, the MR (Magnet Resistor) element might be damaged.)
5. Take care not to deform the anti-fall hooks of the slow brake lever and supply/take-up loading gears more than required.

REMOVAL AND REASSEMBLY OF LOADING BLOCK

● Removal

1. Remove the leads ①.
2. Remove the cassette loading belt ②.
3. Unscrew the three screws ③.
4. Pull the loading block upward.

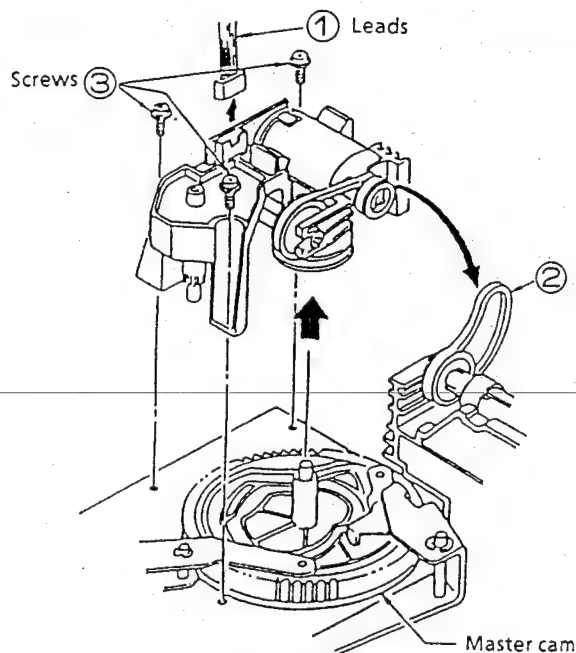


Figure 1-66.

Notes:

When using a magnetic screw driver in removal of three screws, do not allow the magnetic driver to hit the A/C head or drums.

● Reassembly

1. Turn the master cam all the way counter-clockwise.
2. Match the tally mark on the cam switch with the mating mark. Fit the loading block and the master cam with each other. Tighten up the three screws.

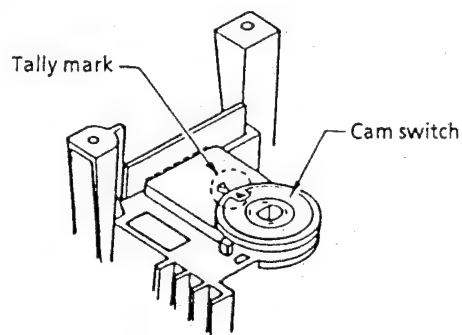


Figure 1-67.

3. Finally connect the leads and apply the cassette loading belt.

Notes:

1. Be careful not to scratch the gear.
2. Be careful not to stain the belt. If dirty, clean it up with the specified cleaning liquid.

REPLACEMENT OF LOADING MOTOR

1. Set the cassette ejected condition by placing the unit in the cassette eject mode.
2. Unplug the power cord.
3. Remove the loading block in accordance with the statements and drawings above.

● Removal

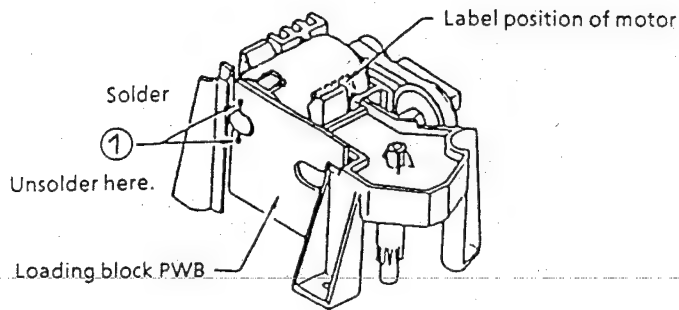


Figure 1-68.

1. Unsolder the leads ① from the loading motor.
2. Unlock the left and right catches ② of the cam switch off the loading block. Take out the cam switch and loading block PWB (See Figure 1-69).

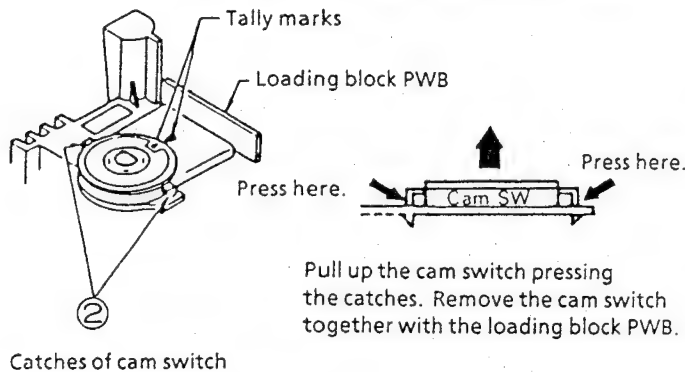


Figure 1-69.

3. Take out the loading belt ③.
4. Pry up the back end of the loading motor with a screwdriver or the like as in Figure 1-70 and take out the motor.

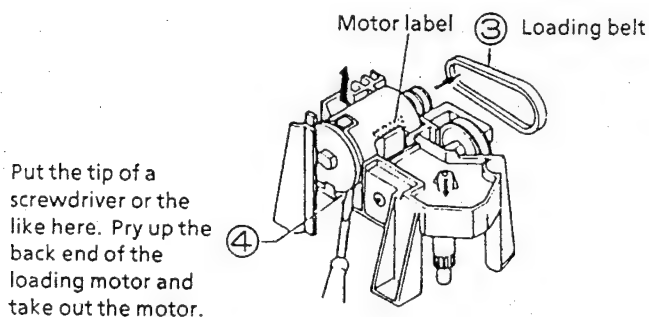


Figure 1-70.

● Reassembly

1. Remove the loading motor, and mount a new loading motor as in Figure 1-71.
2. Place the loading motor so that its label is visible as shown in Figure 1-71. Make sure that the screw hole at the motor shaft, protuberance on the loading block, and the motor's back end marked with the arrow are mated with each other.

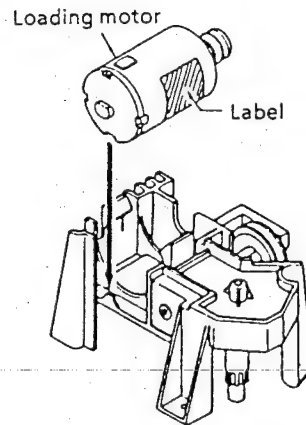


Figure 1-71.

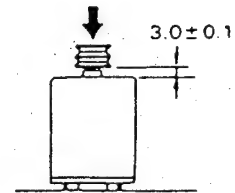


Figure 1-72.

Note:
When press-fitting the loading motor pulley, keep the pressure less than 5 kg, and the gap between the motor and pulley should be 3.0 ± 0.1 mm.

3. Set the loading block PWB and the cam switch in position.
4. Resolder the leads to the loading motor.
5. Finally place the loading block (See page 27).
6. Attach the loading belt.

REPLACEMENT OF MASTER CAM

● Removal

1. Remove the E ring ①.
2. Remove the half-loading drive lever ②.
3. Remove the E ring ③.
4. Remove the pinch roller lever ④.
5. Pull out the master cam ⑤ upward.

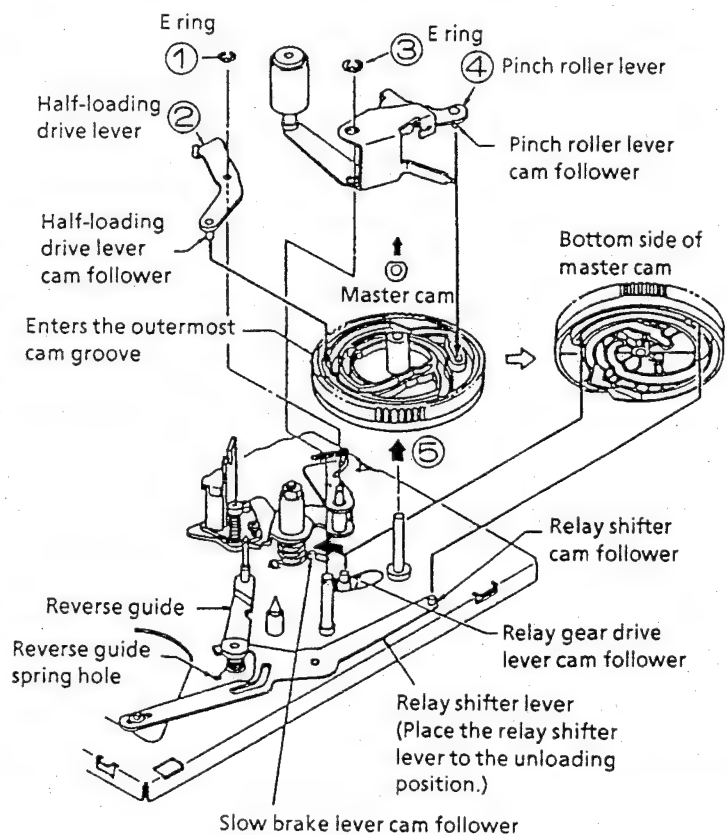


Figure 1-73.

● Reassembly

1. Place the relay gear drive lever in the unloading state.
2. Place the relay shifter so that it is in contact with the reverse guide spring hole in the mechanism chassis. Release the slow brake lever with a finger to bring it away from the capstan (in the direction of arrow). Then place the master cam so that the D cut-off part of the master cam faces the direction of arrow.
3. Place the half-loading reciprocating lever's cam follower so that it fits in the master cam's circumferential cam groove (marked with arrow), attach the E ring, then mount the half-loading reciprocating lever.
4. Turn the master cam somewhat clockwise until the pinch roller lever's cam follower goes into the master cam's groove (marked with arrow). Mount the pinch roller lever and then attach the E ring.
5. Rotate the master cam by hand to make sure all the four levers (relay gear drive lever, half-loading reciprocating lever, pinch roller lever, and relay shifter lever) are in the cam grooves in place.
6. Mount the loading block. (See page 27.)

Notes:

1. Be careful not to scratch the teeth and grooves of the master cam.
2. After installation of the master cam, be sure to rotate the master cam by hand before installing the loading block. If the levers are in wrong position, the master cam and the levers may get damaged when the motor starts.
3. Apply specified grease to the master cam's grooves and teeth.

REPLACEMENT OF UPPER DRUM

Notes:

The gap between the lower drum and the upper drum is very accurate, in the order of microns, and care should be paid to their replacement. Even a slight amount of foreign material will affect the accuracy of their reassembly.

- Replacement (Follow the order of the indicated numbers.)

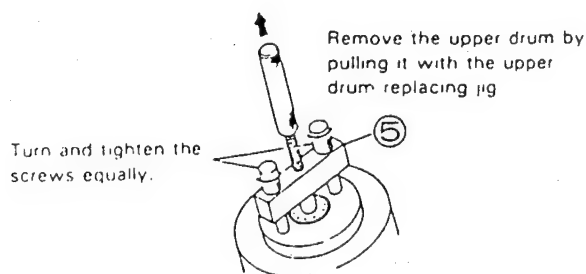
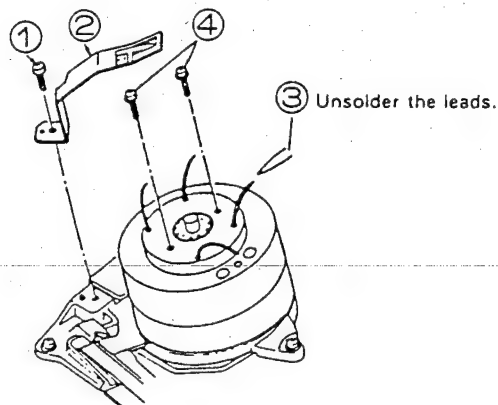


Figure 1-74.

Notes:

1. Avoid touching the drum surface with bare hands.
2. Pull out the upper drum with care so that it may not be tilted, and replace it with the upper drum replacing jig using care not to damage the disk circumference.
3. Do not hit the screws when tightening them.

- Reassembly

Notes:

1. Before setting the drum, check that there are no scratches or dust on the edge of the surface and circumference of the disk.
2. Before setting the drum, check that there are no scratches or dust on the internal surface and edge of the surface of the upper drum.
3. On assembling these parts, insert the upper drum onto the disk with care, so that the upper drum is not tilted.
4. When assembling these parts, do not allow dust or dirt come between the disk and the upper drum.
5. Do not use excessive force when driving in the screws.

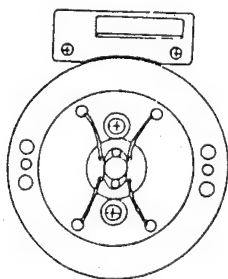


Figure 1-75.

1. Set the new drum.
2. Fasten the upper drum in place with the two screws.
3. Solder the leads.

Note:

Soldering should be performed quickly and carefully without touching adjacent patterns.

4. After replacement, be sure to check the tape drive train adjustment (see page 24.) and the following electric adjustments.
 - Adjustment of the playback switching point.
 - Checking and adjustment of the X-position.

REPLACEMENT OF D.D. MOTOR

1. Put the unit in the cassette eject position.
2. Unplug the power cord.

- Removal (Reverse the order in reassembly.)

1. Remove the FFC ①.
2. Remove the two D.D. rotor assembly setscrews ②.
3. Pull out the D.D. rotor ass'y ③.
4. Remove the three D.D. stator setscrews ④.
5. Remove the D.D. stator assembly ⑤.

Notes:

1. When removing the D.D. rotor assembly or D.D. stator assembly, use care not to hit the loading relay gear.
2. Secure the D.D. rotor assembly so that the installation positioning holes in the D.D. rotor assembly and lower drum assembly match.
3. Be careful not to damage the upper drum or the video head.
4. Be sure that the hall device and the D.D. stator assembly are not damaged by the D.D. rotor assembly or other parts.
5. After installation, adjust the playback switching point.

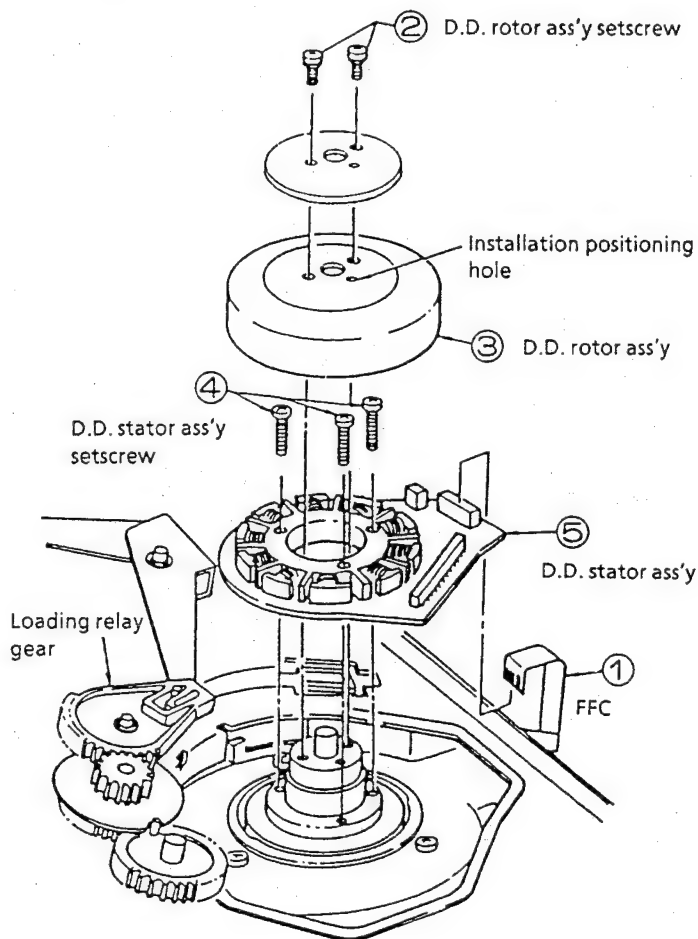


Figure 1-76.

REPLACING THE AHC (AUTOMATIC HEAD CLEANER)

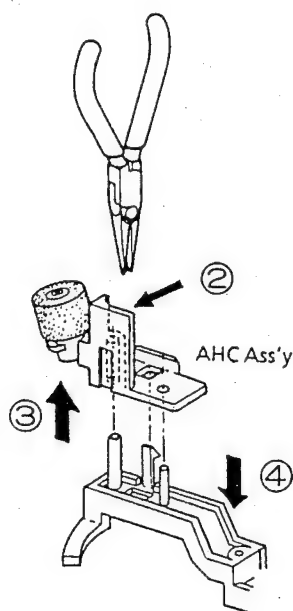
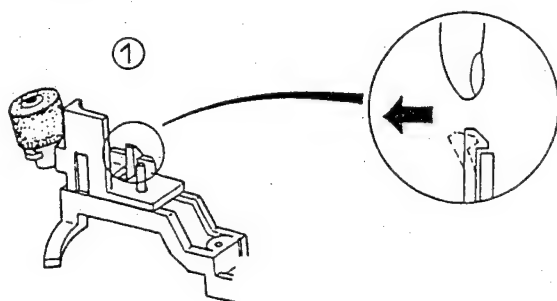


Figure 1-77.

• Removal

Unhook part ① with a finger in the direction of arrow.

Hold the rib (marked with an arrow) of the AHC ass'y ② with electrician's pliers or the like, and pull the ass'y upward in the direction of arrow ③.

Note:

To pull out the AHC ass'y, hold the AHC lever down.

• Reassembly

Push down the AHC ass'y in the direction of arrow ④. Make sure that the ass'y is secured in position by the hook of part ①.

Notes:

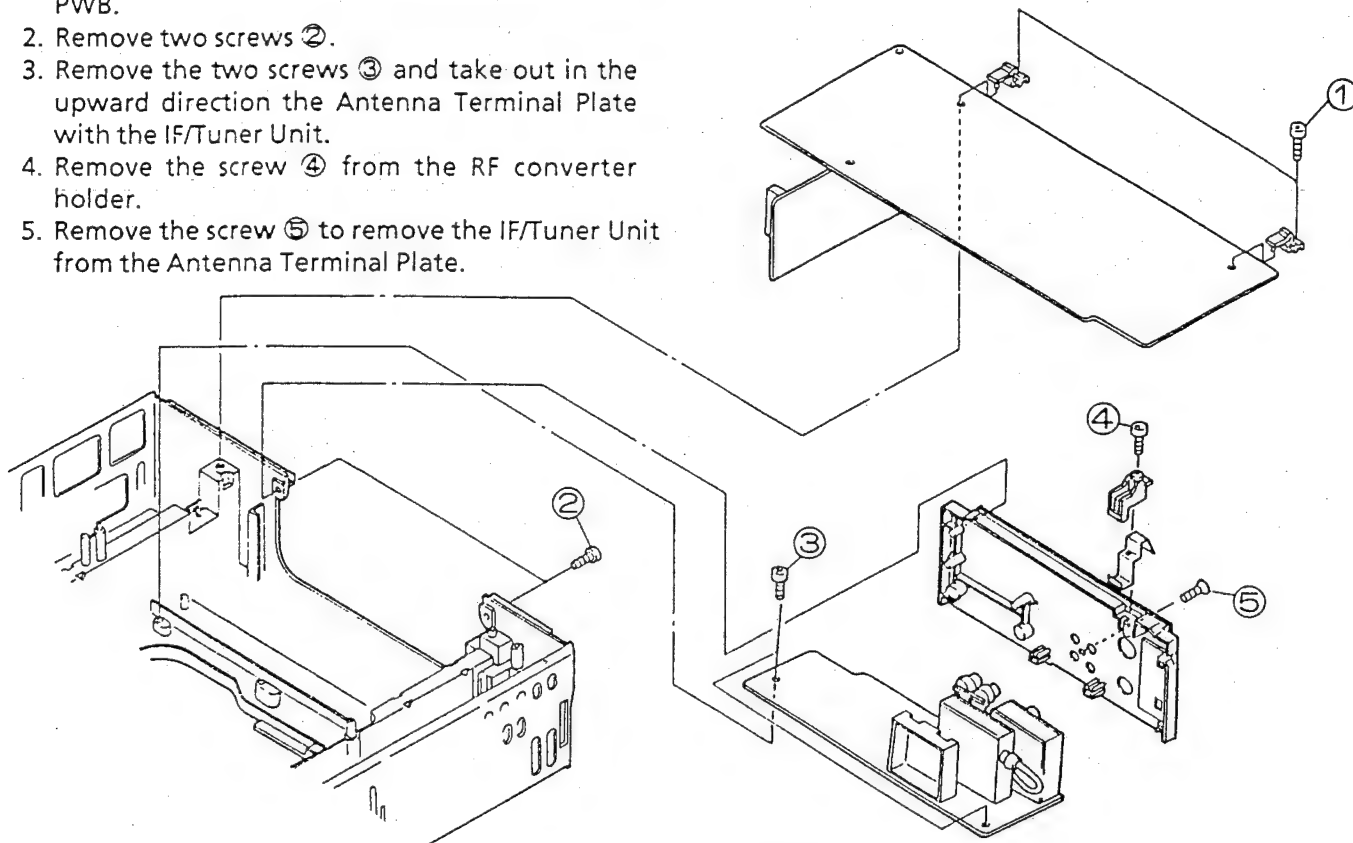
1. Be careful to keep the AHC ass'y out of contact with the drum.
2. Be careful to keep the cleaner section of the ass'y free of grease or contaminants.

ADJUSTMENT OF THE ELECTRICAL CIRCUITRY

■ DISASSEMBLY OF IF/TUNER AND POWER UNITS

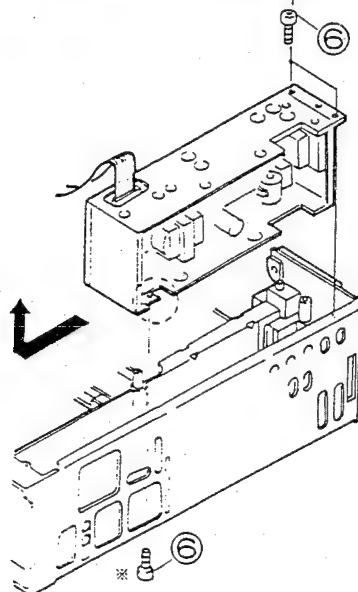
IF/Tuner Unit

1. Remove two screws ① which fasten the Main PWB.
2. Remove two screws ②.
3. Remove the two screws ③ and take out in the upward direction the Antenna Terminal Plate with the IF/Tuner Unit.
4. Remove the screw ④ from the RF converter holder.
5. Remove the screw ⑤ to remove the IF/Tuner Unit from the Antenna Terminal Plate.



Power Unit

1. Remove three screws ⑥ which fasten the Power Unit.
2. Slide the Power Unit in the direction of the arrow to uncouple it from the main frame, and remove the Power Unit in the upward direction.



Note:

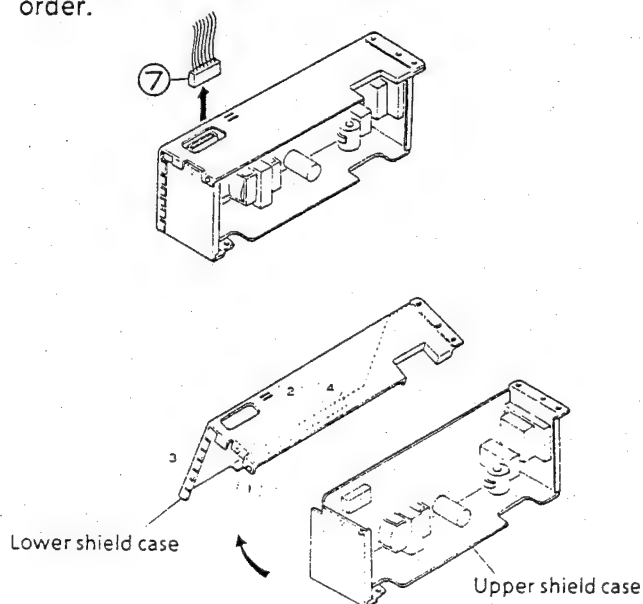
The screw marked (※) is used to tighten up the bottom plate.

Power Unit Shield Case

1. Remove the wire lead with Connector PA ⑦.
2. Hold the Upper Shield Case down and remove the Lower one by turning it in the direction of the arrow.

Note:

For easier coupling, fit at locations (1) to (4) in this order.



Prior to the adjustment:

In most cases, necessity for electrical circuits will arise from replacement of mechanical parts including the video head. Before starting adjustment of electrical circuits, check that mechanical operation of the equipment is complete (the mechanism are adjusted completely).

If the equipment fails electrically, locate a defect or defects first of all using instruments. Then repair or replace parts and make adjustment by the procedures described below.

When required instruments are not available, do not move controls indiscriminately.

- Instruments

- Colour monitor TV
- DC regulated power supply
- VTVM

- Oscilloscope

- Audio generator
- Connector (QCNW-6443GEZZ)

- Colour bar generator

- Alignment tape


- Frequency counter

- Blank video tape (VHS)

■ ADJUSTMENT OF POWER CIRCUIT

Adjustment of power circuit (UR6.5V)

Measuring instrument	Voltmeter
Mode	Recording (SP mode)
Test point	Pin 4 of AP connector located on the Main PWB.
Control	R928
Adjusting point	$6.6 \pm 0.1 \text{ V}$

1. Remove the AC cord.
2. Remove the three power unit fastening screws. Lift up the power unit from front side and move it toward  direction.
3. Connect the AC cord and power supply.
4. Connect the voltmeter to Pin 4 of AP connector and Ground.
(AP connector located on the MAIN PWB.)
5. Set the unit in the recording mode.
Adjust R928 so that the voltmeter reads $6.6 \pm 0.1 \text{ V}$.

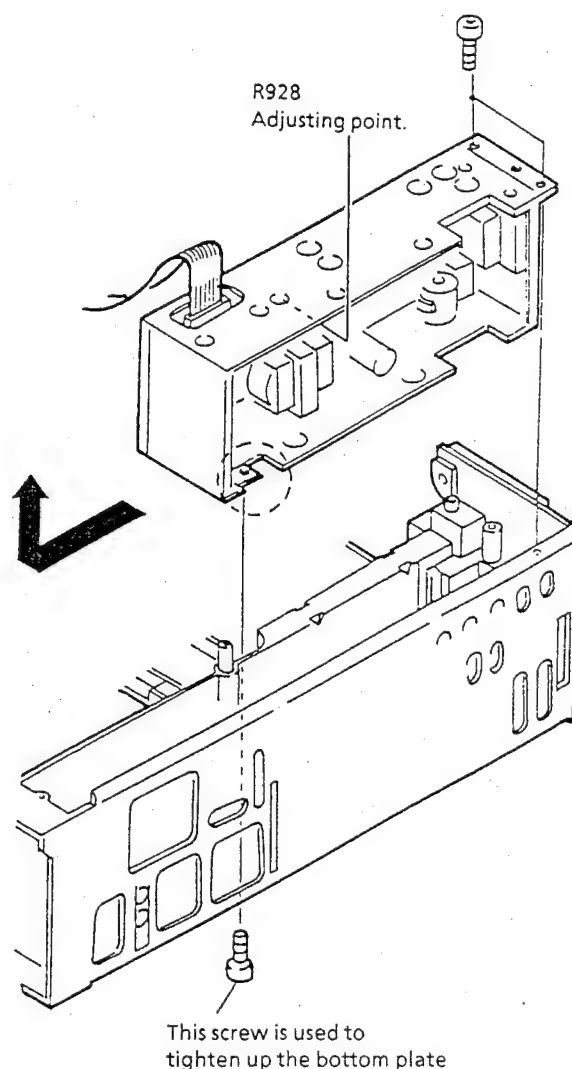


Figure 2-1. POWER

ADJUSTMENT OF SYSTEM CONTROL/SERVO CIRCUIT

- Test points layout

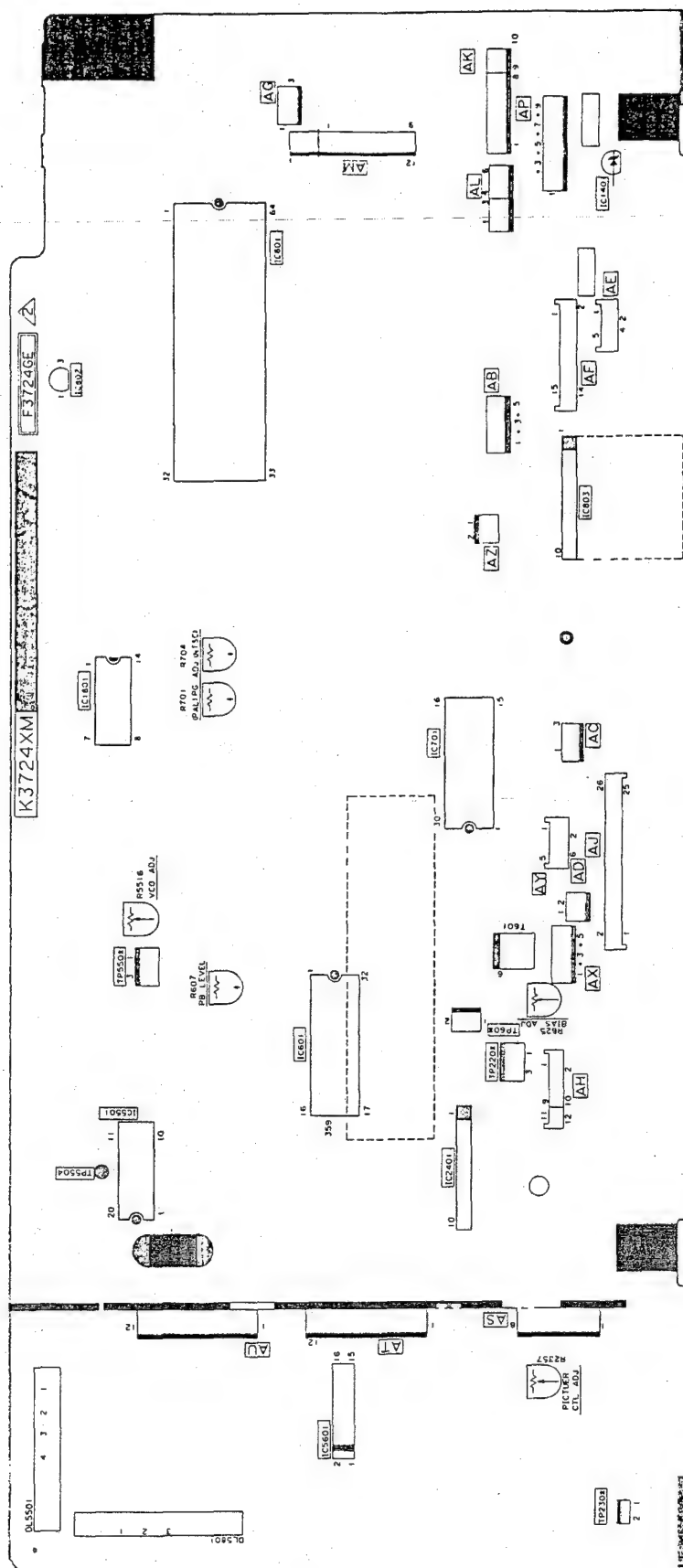


Figure 2-2. MAIN PWB

■ ADJUSTMENT OF SERVO CIRCUIT (PAL)

Adjustment of PAL system playback switching point

Measuring instrument	Oscilloscope
Mode	Playback (Tracking at center)
Tape used	Alignment tape (VROCPSV)
Test point	CH-1; TP2202 CH-2; Video output terminal (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side)
Control	R701 (Phase generator M.M.)
Specification	$6.5 \pm 0.5H$

1. Insert the PAL system alignment tape (VROCPSV) and put the unit in the playback mode.
2. Press the unit to tracking in the center mode. (See note below.)
3. Adjust R701 (phase generator M.M.) so that the waveform on the oscilloscope screen be as shown Figure 2-3.

Note:

How to tracking in the center mode.

1. Remove the cassette housing.
2. Press the test button on the located on the timer PWB.

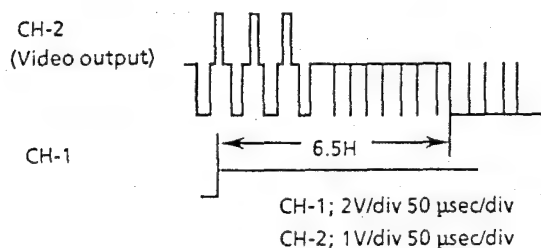


Figure 2-3.

Adjustment of PAL system SP slow tracking

Measuring instrument	Monitor TV
Mode	Recording and playback on self-recording tape.
Input signal	Commercial broadcast or video signal. (External input selector switch)
Test Point	Monitor screen
Adjusting point	Tracking control button (+) or (-)
Specification	No noise bar on the monitor TV screen

1. Play back the self-recording tape in the PAL system SP mode.
2. Press the test button so that the test mode.
3. Be sure that all the fluorescent display tubes light up.
4. Press the slow button and playback the recorded portion in the slow mode.
5. Adjust the tracking control using the tracking button on the main unit or the remote controller so that there is no noise on the screen.
6. Press the stop button in the slow tracking preset data are memorized.
7. Press the all clear button in the return to normal mode.

Adjustment of still picture vertical sync.

Measuring instrument	Monitor TV
Mode	Still picture playback
Input signal	Self-recording tape
Test point	Monitor screen
Adjusting point	Tracking control button (+) or (-)
Specification	No noise jitter

1. Play back the self-recording tape in the PAL system SP mode.
2. Press the test button so that the test mode.
3. Be sure that all the fluorescent display tubes light up.
4. Press the still button and playback the recorded portion in the SP mode.
5. Adjust the tracking control using the tracking button on the main unit or the remote controller, make adjustment so that jitter becomes minimum.
6. Press the stop button in the still preset data are memorized.
7. Press the all clear button in the return to normal mode.

■ ADJUSTMENT OF SERVO CIRCUIT (NTSC)

Adjustment of NTSC system playback switching point

Measuring instrument	Oscilloscope
Mode	Playback (Tracking at center)
Tape used	Alignment tape (VROATSV)
Test point	CH-1; TP2202 CH-2; Video output terminal (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side)
Control	R704 (Phase generator M.M.)
Specification	$6.5 \pm 0.5H$

1. Insert the NTSC system alignment tape (VROATSV) and put the unit in the playback mode.
2. Press the unit to tracking in the center mode. (See note below.)
3. Adjust R704 (phase generator M.M.) so that the waveform on the oscilloscope screen be as shown Figure 2-4.

Note:

How to tracking in the center mode.

1. Remove the cassette housing.
2. Press the test button on the located on the timer PWB.

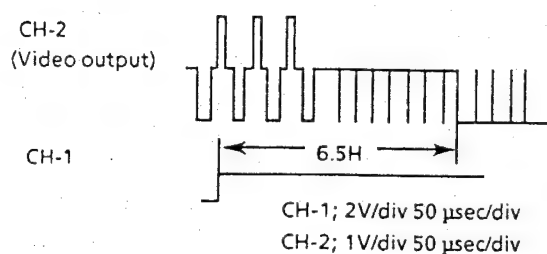


Figure 2-4.

Adjustment of NTSC system SP slow tracking

Measuring instrument	Monitor TV
Mode	Playback (SP mode playback)
Tape used	Alignment tape (VRONBZZS)
Test Point	Monitor screen
Adjusting point	Tracking control button (+) or (-)
Specification	No noise bar on the monitor TV screen

1. Insert the NTSC system alignment tape (VRONBZZS) and put the unit in the SP portion playback mode.
2. Press the test button so that the test mode.
3. Be sure that all the fluorescent display tubes light up.
4. Press the slow button and playback the SP portion in the slow mode.
5. Adjust the tracking control using the tracking button on the main unit or the remote controller so that there is no noise on the screen.
6. Press the stop button in the slow tracking-preset data are memorized.
7. Press the all clear button in the return to normal mode.

Adjustment of still picture vertical sync.

Measuring instrument	Monitor TV
Mode	Still picture playback
Tape used	Alignment tape (VRONBZZS)
Test point	Monitor screen
Adjusting point	Tracking control button (+) or (-)
Specification	No noise jitter

1. Insert the NTSC system alignment tape (VRONBZZS) and put the unit in the SP portion playback mode.
2. Press the test button so that the test mode.
3. Be sure that all the fluorescent display tubes light up.
4. Press the still button and playback the SP portion in the still mode.
5. Adjust the tracking control using the tracking button on the main unit or the remote controller, make adjustment so that jitter becomes minimum.
6. Press the stop button in the still preset data are memorized.
7. Press the all clear button in the return to normal mode.

■ ADJUSTMENT OF Y/C CIRCUIT

● Test point layout

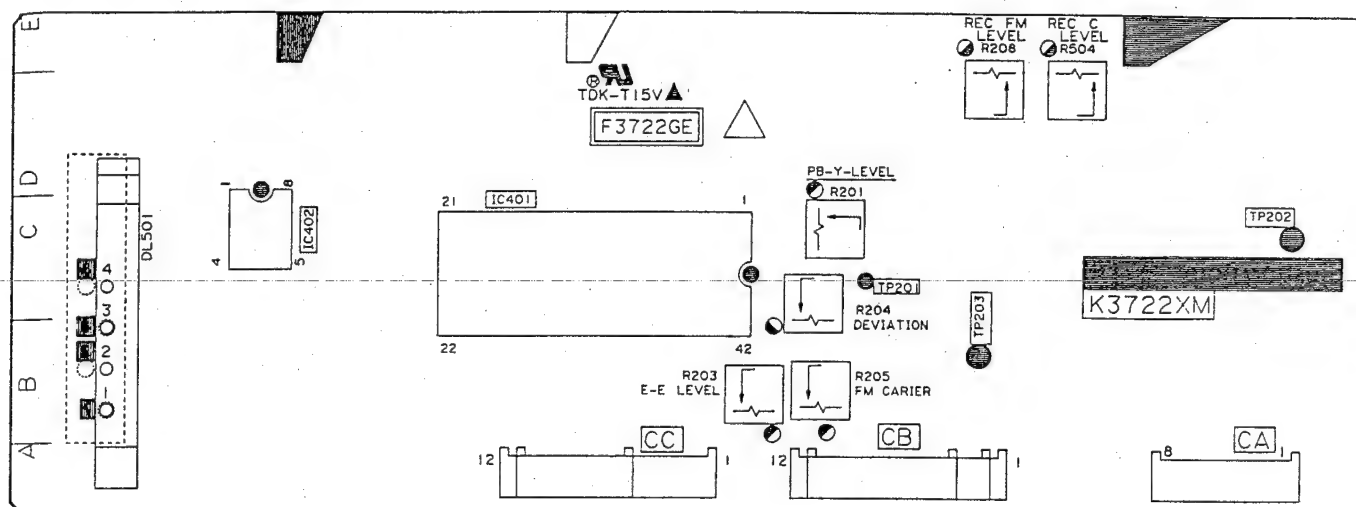


Figure 2-5. Y/C PWB

Adjustment of EE level

Measuring instrument	Oscilloscope
Mode	EE or Record
Input signal	Standard colour bar (stair-case waveform)
Test point	Video output terminal
Adjusting point	R203 (EE level control)
Specification	1.0 ± 0.06 Vp-p

1. Connect a 75 ohm resistor to the video output terminal and hook the oscilloscope across this resistor. (See note below.)
2. Feed the colour bar signal to the video input terminal in the EE or recording mode.
3. Adjust R203 so that the signal amplitude is 1.0 Vp-p as shown in Figure 2-6.

Note:

If the terminating resistor is missing, the signal amplitude will be doubled.

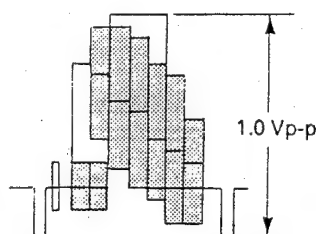


Figure 2-6.

Adjustment of playback video signal level

Measuring instrument	Oscilloscope
Mode	Playback
Tape used	Alignment tape (VROCP5V)
Test point	Video output terminal
Adjusting point	R201 (Playback Y-level control)
Specification	1.0 ± 0.06 Vp-p

1. Connect a 75 ohm resistor to the video output terminal and connect an oscilloscope across this resistor. (See note below.)
2. Play the colour bar portion of the alignment tape and adjust R201 so that the signal amplitude is measured 1.0 Vp-p on the oscilloscope as shown in Figure 2-7.

Note:

If the terminating resistor is missing, the signal amplitude will be doubled.

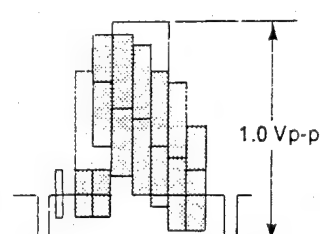


Figure 2-7

Adjustment of FM carrier and deviation

Measuring instrument	Frequency counter, Oscilloscope
Mode	Record/Playback (SP mode)
Input signal	Standard colour bar (stair-case waveform)
Test point	TP301 (GND at TP302) Video output terminal
Adjusting point	R205 (FM carrier control) R204 (Deviation control)
Specification	3.8 ± 0.05 MHz 1.0 ± 0.04 Vp-p

1. Make sure that R203 (E-E level) and R201 (playback Y-Level) have been correctly adjusted.
2. Connect a 75 ohm terminating resistor to the video output terminal and connect an oscilloscope across this resistor.
3. Connect a frequency counter to TP301 and TP302.
4. Place the unit in record mode and get it ready for external input with no signal. (Disconnect any cable from video input terminal.)
5. Adjust R205 so that the frequency counter reading be 3.8 MHz.
6. Feed the standard colour bar signal (stair-case waveform) and make self-recording and playback.
7. Observe the video output terminal voltage (across the terminal resistor) on the oscilloscope screen. If the playback video signal level is above 1.0 Vp-p, turn R204 clockwise. If below 1.0 Vp-p, turn the control counter clockwise. Now make self-recording and playback again.
8. Repeat the above step (7) to finally get the playback video signal level at 1.0 ± 0.04 Vp-p, as shown in Figure 2-8.

Note:

1. Carry out this adjustment only when IC401 has been replaced or when the carrier setting (3.8 MHz) or the deviation is found apparently out of specification
2. If the terminating resistor is missing, the signal amplitude will be doubled.

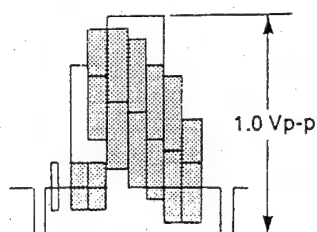
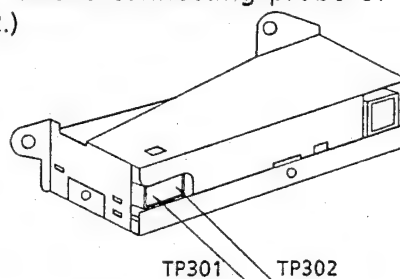


Figure 2-8.

Adjustment of recording current

Measuring instrument	Oscilloscope
Mode	Record
Input signal	Standard colour bar (stair-case waveform)
Test point	TP301, TP302 (GND) [External trigger: Video output terminal]
Adjusting point	R504 (Record Chroma Level Control) R208 (Record FM level control)
Specification	30 ± 2 mVp-p (Chroma) 130 ± 10 mVp-p (FM-Y)

1. Feed the standard colour bar signal (stair-case waveform) to the video input terminal.
2. Connect the oscilloscope's GND and SIG leads to TP302 and TP301, respectively. (for convenient connection of the oscilloscope, use QCNW-6443GEZZ.)
3. Set the unit in the recording mode.
4. Turn R208 to minimize the FM luminance signal.
5. Adjust R504 so that the amplitude of red portion is 30 ± 2 mVp-p as shown in Figure 2-9.
6. Adjust R208 so that the amplitude of sync tip portion is 130 ± 10 mVp-p as shown in Figure 2-10.
7. Remove QCNW-6443GEZZ after adjustment. (Also remove connecting probe of TP301 and TP302.)



Note:

TP301 and TP302 are located on the head amp module.

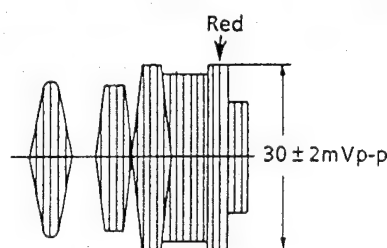


Figure 2-9.

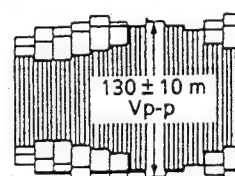


Figure 2-10.

■ ADJUSTMENT OF NTSC → PAL SIMPLE CONVERSION CIRCUIT

■ ADJUSTMENT OF AUTO PICTURE CONTROL CIRCUIT

- Test points layout

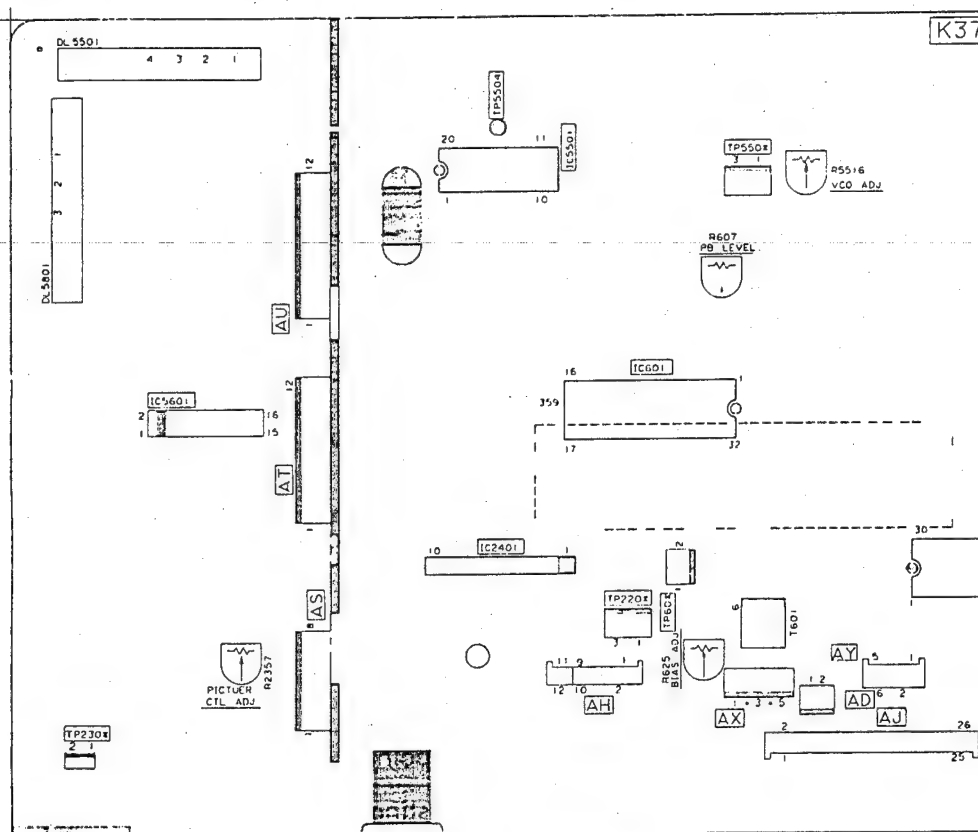


Figure 2-11. MAIN PWB

Adjustment of VCO free-run frequency

Measuring instrument	Frequency counter
Mode	Playback
Tape used	Alignment tape (VROATSV)
Test point	TP5502 (SIG) TP5501 (GND)
Control	R5516 (VCO control)
Specification	15735 ± 20 Hz

1. Play back the alignment tape (VROATSV). Set the colour mode switch to "AUTO" or "NT" position.
2. Make a short-circuit between TP5504 (pin 15 of IC5501) and TP5503 (PC5V) using a lead with clip.
3. Connect a frequency counter to TP5502. Adjust R5516 so that the counter reads the value below.
Specification: 15735 ± 20 Hz
(A free-run state is brought in the step 2 above, however A pull-in of ± 30 Hz or so is still caused.)
4. Disconnect the clip-fitted lead and make sure that the image is reproduced in colours in the PAL mode. (With a PAL CTV or a multi-system CTV in the PAL mode)

Adjustment of auto picture control

Measuring instrument	Digital volt meter
Mode	Recording and playback on self-recording tape.
Input signal	Standard colour bar (stair-case waveform)
Test point	TP2301 (SIG), TP2302 (GND)
Adjusting point	R2357 (Picture control)
Specification	$2.4 \pm 0.1 \text{ V}$

1. Play back the tape self-recorded. (Colour bar signal.)
2. Set the auto picture switch to "ON" or "AUTO PICTURE" position and picture tone volume in center.
3. Connect the digital volt meter to TP2301 (SIG) and TP2302 (GND). Adjust R2357 so that the digital volt meter reads 2.4 ± 0.1 V.

■ ADJUSTMENT OF AUDIO CIRCUIT

● Test point layout

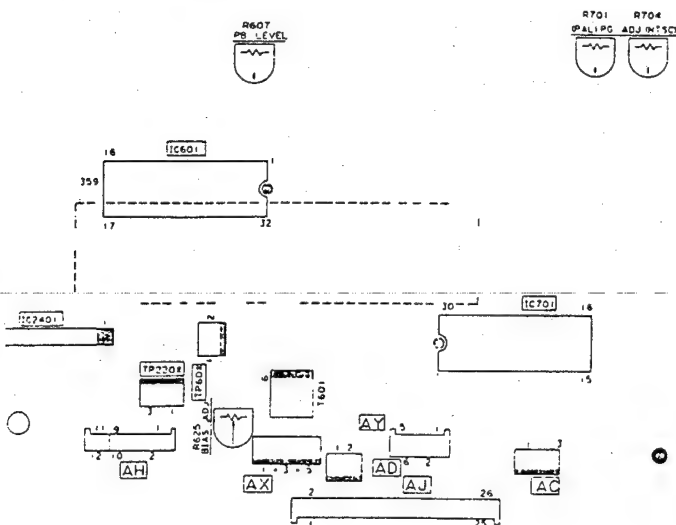


Figure 2-12. MAIN PWB

Adjustment of playback level

Measuring instrument	VTVM
Mode	Playback
Input signal	Alignment tape (VROCPSV) (1kHz level control signal)
Test point	Audio output terminal
Adjusting point	R607 (Playback level control)
Specification	-9 ± 1 dBs

1. Play back the alignment tape (1kHz level control signal).
2. Hook up the VTVM to the audio output terminal.
3. Adjust R607 (playback level control) so that the output level be -9 ± 1 dBs.

Checking of erase voltage and oscillation frequency

Measuring instrument	Oscilloscope
Mode	Recording
Input signal	_____
Test point	Both ends of the full-erase head
Adjusting point	_____
Specification	Erase voltage; Over 40 Vp-p Oscillation frequency; 70 ± 5 kHz

1. Place the unit to the record mode.
2. Hook up the oscilloscope to both ends of the full-erase head.
3. Make sure the erase voltage is over 40 Vp-p.
4. Be sure that the oscillation frequency is 70 ± 5 kHz.

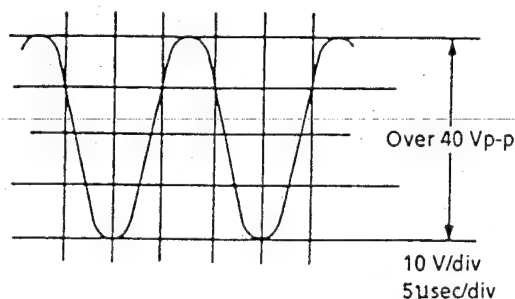


Figure 2-13.

Adjustment of bias current

Measuring instrument	VTVM
Mode	Recording
Input signal	_____
Test point	TP601 (SIG), TP602 (GND)
Adjusting point	R625 (Bias current control)
Specification	$280 \pm 10 \mu\text{A}$

1. Place the unit to the record mode.
2. Connect the VTVM to TP601 (SIG) and TP602 (GND).
3. Adjust R625 (bias current control) so that the bias current be $280 \pm 10 \mu\text{A}$ (2.8 ± 0.1 mV).

Checking of recording level

Measuring instrument	VTVM
Mode	Self-recording/playback
Input signal	1 kHz / -8 dBs
Test point	Audio output terminal
Adjusting point	_____
Specification	1 kHz -8 ± 3 dBs

1. Feed 1 kHz, -8 dBs signal to the audio input terminal. Make self-recording and playback of the signal.
2. Make sure the output at the audio output terminal is 1 kHz -8 ± 3 dBs.
3. If out of spec, readjust the playback level and the bias current.

■ ADJUSTMENT OF THE IF CIRCUIT

Adjustment of the RF AGC

Measuring instrument	Oscilloscope Signal generator
Mode	EE
Input signal	Colour bar signal
Test point	TP1551 (GND) TP1552 (Video output)
Adjusting point	VR001 (AGC control)

1. Receive the colour bar signal (input field strength: 80 dB μ).
2. Observe the video output terminal waveform on the oscilloscope. Adjust VR001 (AGC control) in the IF pack until the noise disappears from the oscilloscope screen and the waveform nearly comes into sync.

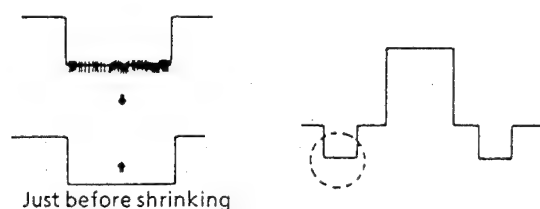


Figure 2-14.

Adjustment of the AFT

Measuring instrument	Oscilloscope Signal generator
Mode	EE
Input signal	PIF frequency uniwave Colour bar signal (70 dB μ)
Test point	TP1551 (GND) TP1552 (Video output)
Adjusting point	T002 (AFT coil)
Specification	_____

1. Receive the colour bar signal (input field strength: 70 dB μ).
2. Using the signal generator, feed the PIF frequency (38.9MHz) signal (sinewave) to the tuner IF output terminal.
3. Set the tuning switch to the VHF or UHF position. Keep the tuning button (+) or (-) depressed until the beating on the oscilloscope screen be minimum.
4. Set the tuning switch on the normal position. Adjust the T002 (AFT coil) so that beating on the oscilloscope screen be minimum.

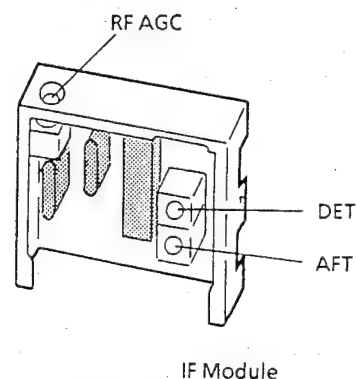


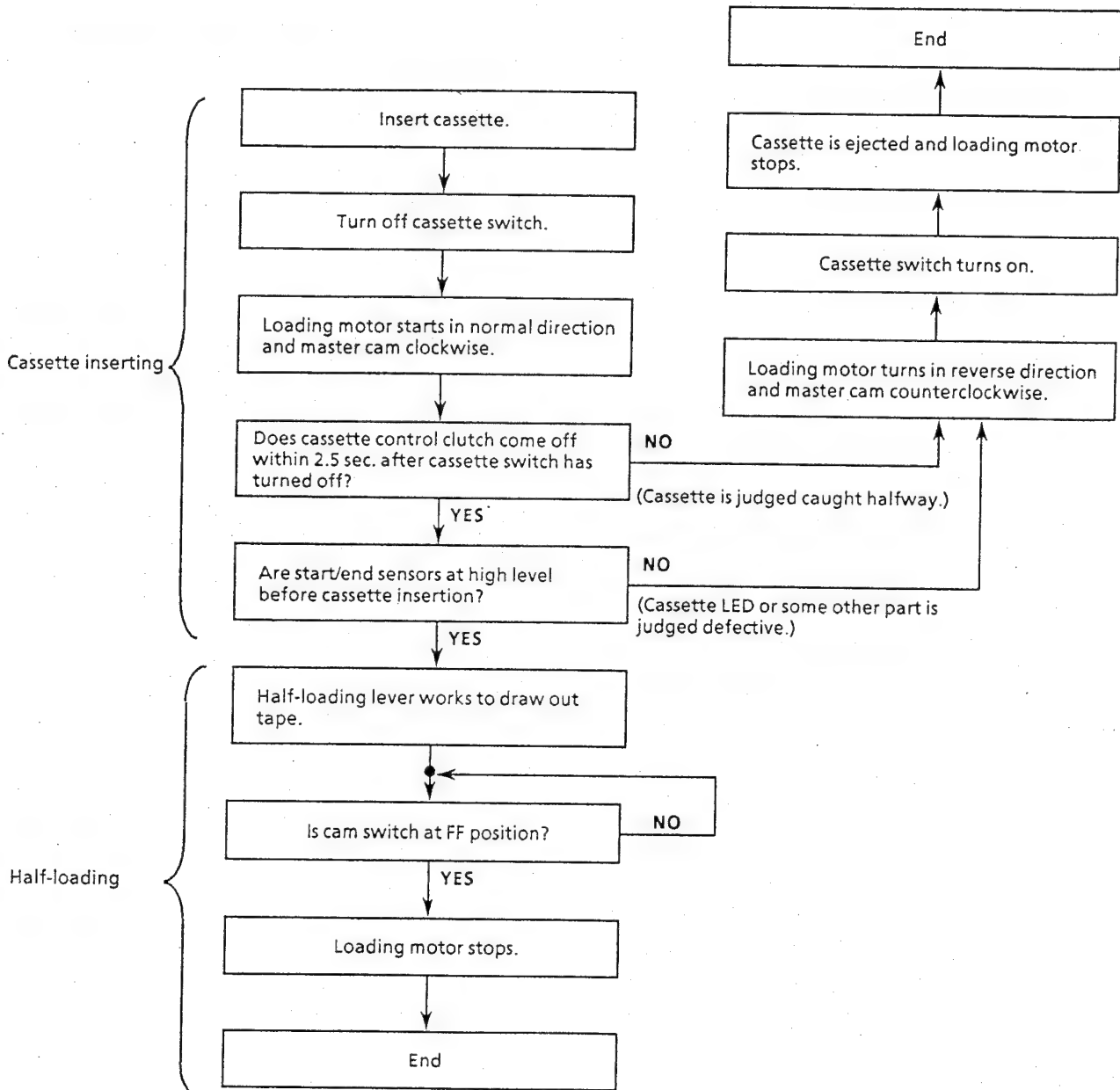
Figure 2-15.

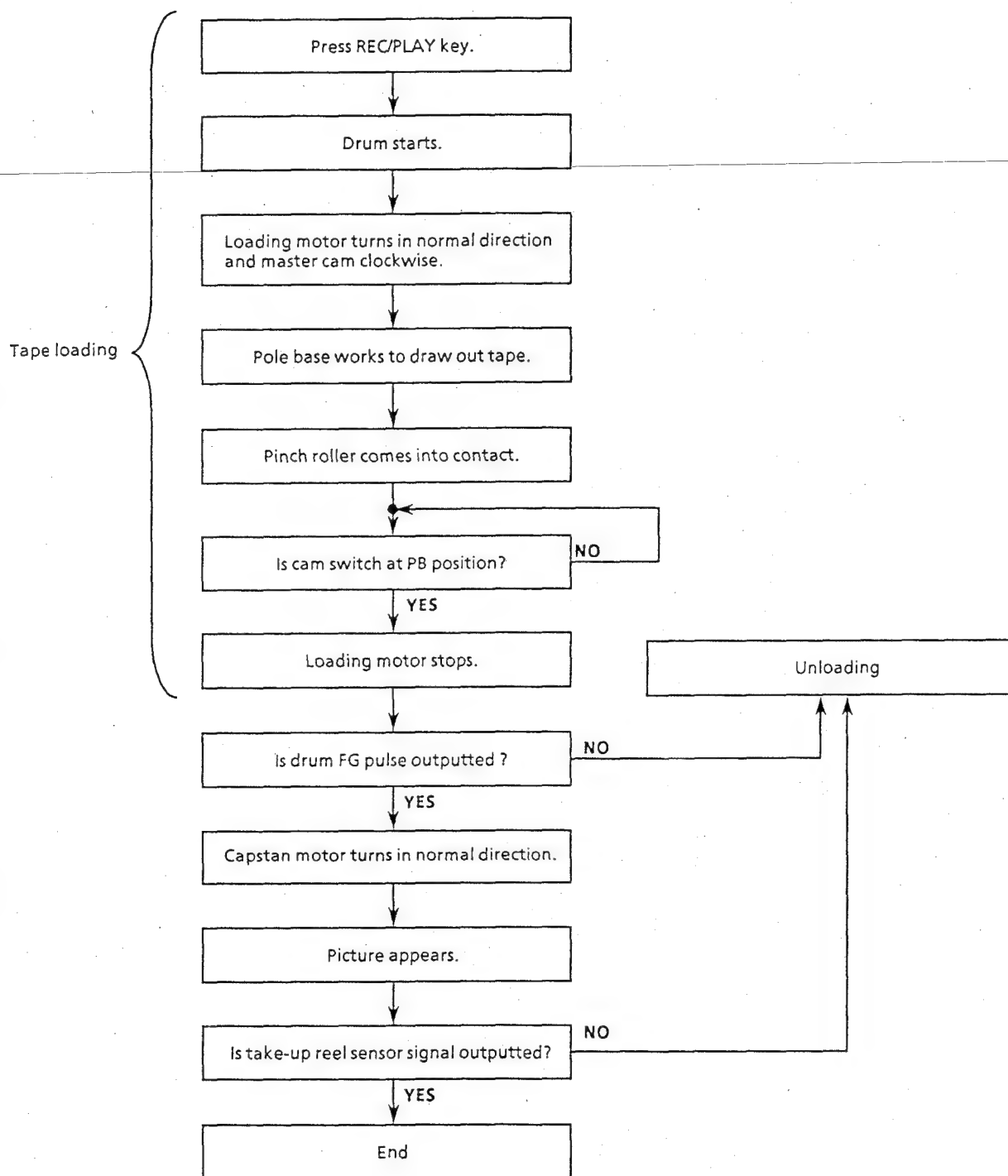
MECHANISM OPERATION FLOW CHART AND TROUBLESHOOTING GUIDE

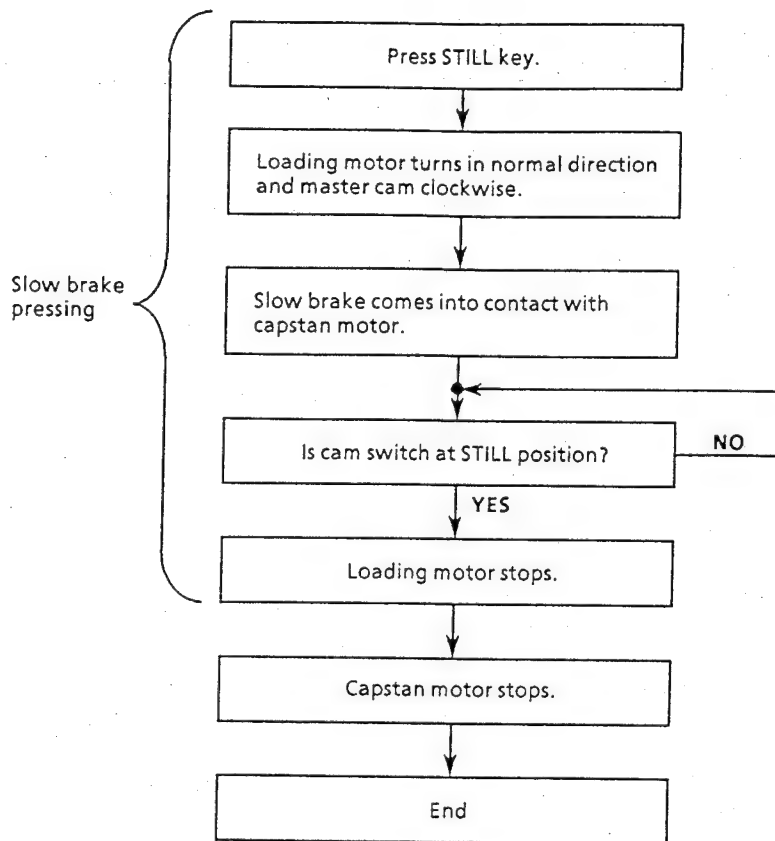
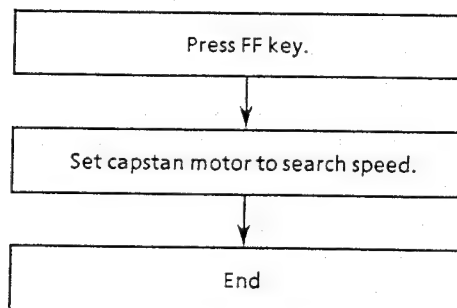
MECHANISM OPERATION FLOW CHART

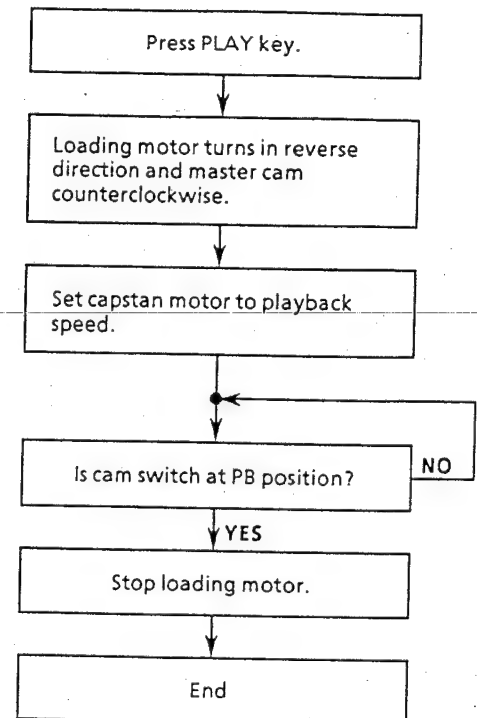
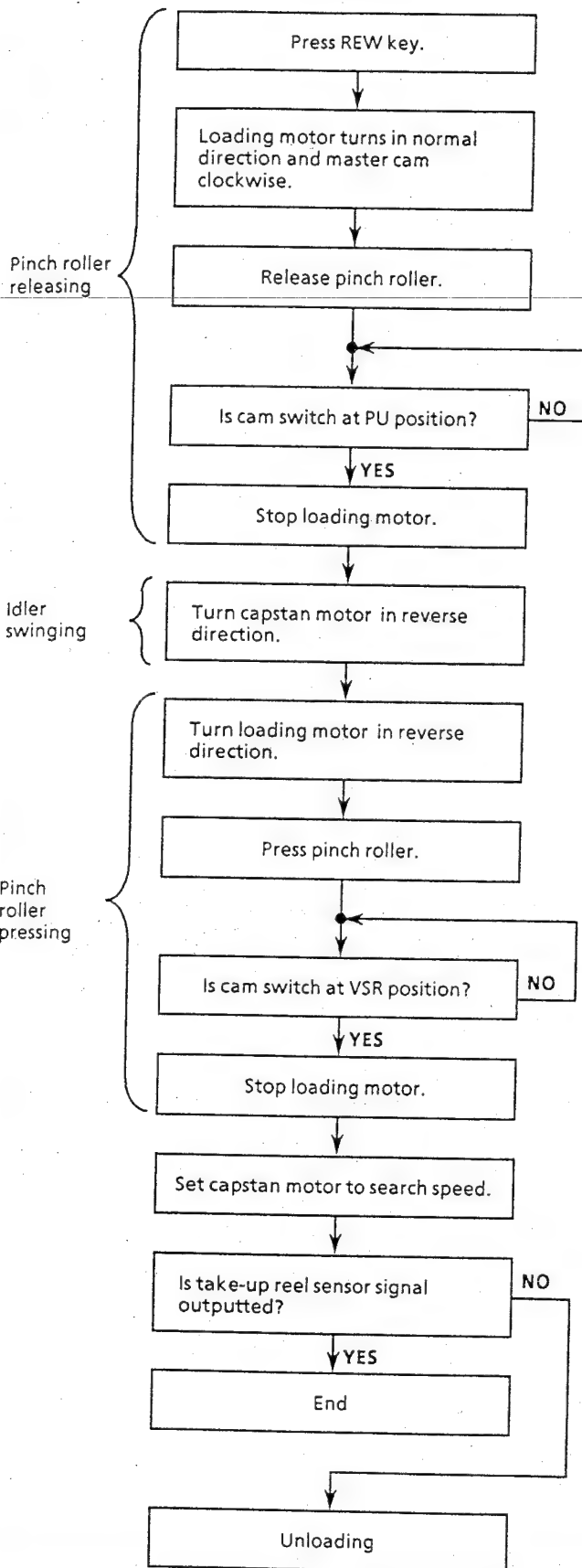
- * This flow chart describes the outline of the mechanism's operation, but does not give its details.
- * For cam switch positions, see Fig. 3-2.

CASSETTE INSERTION → STOP

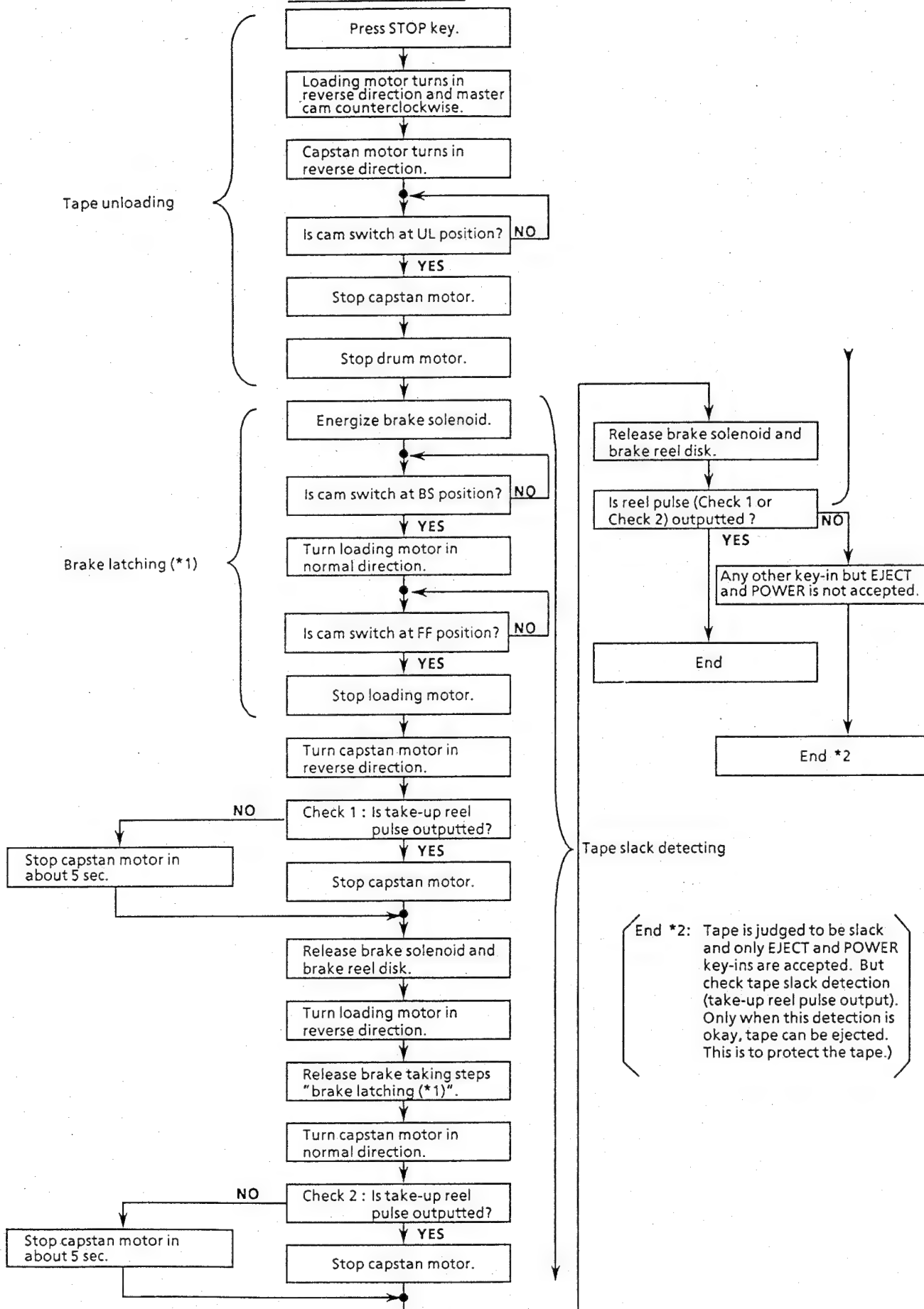


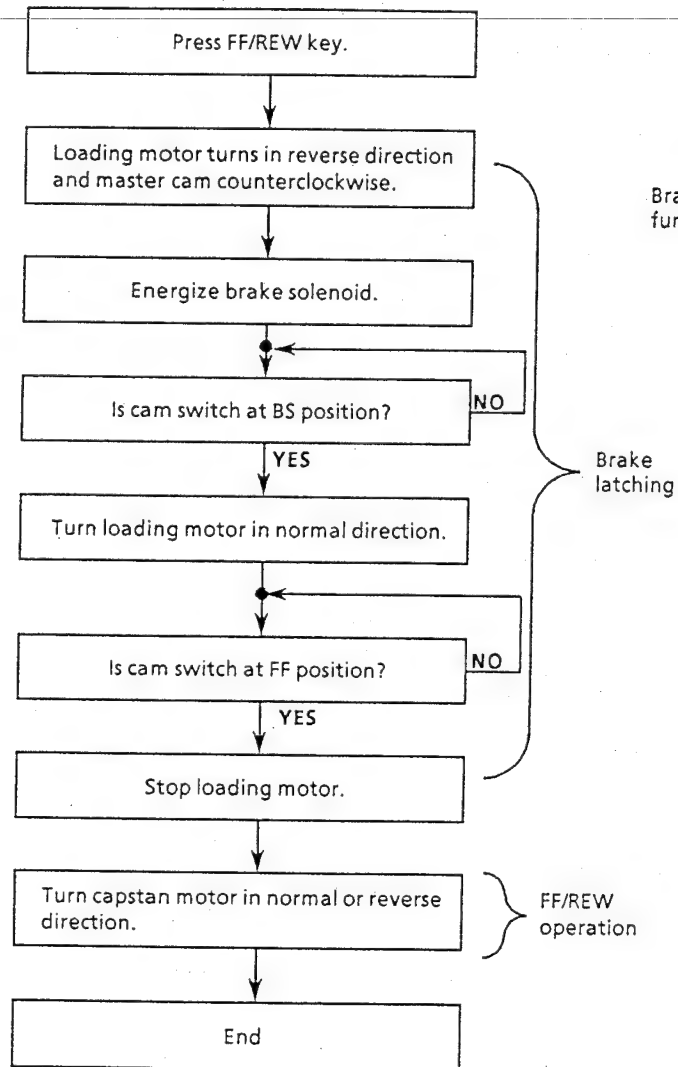
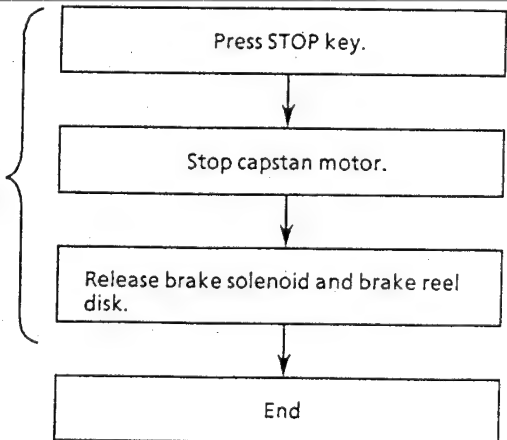
STOP → REC/PLAY

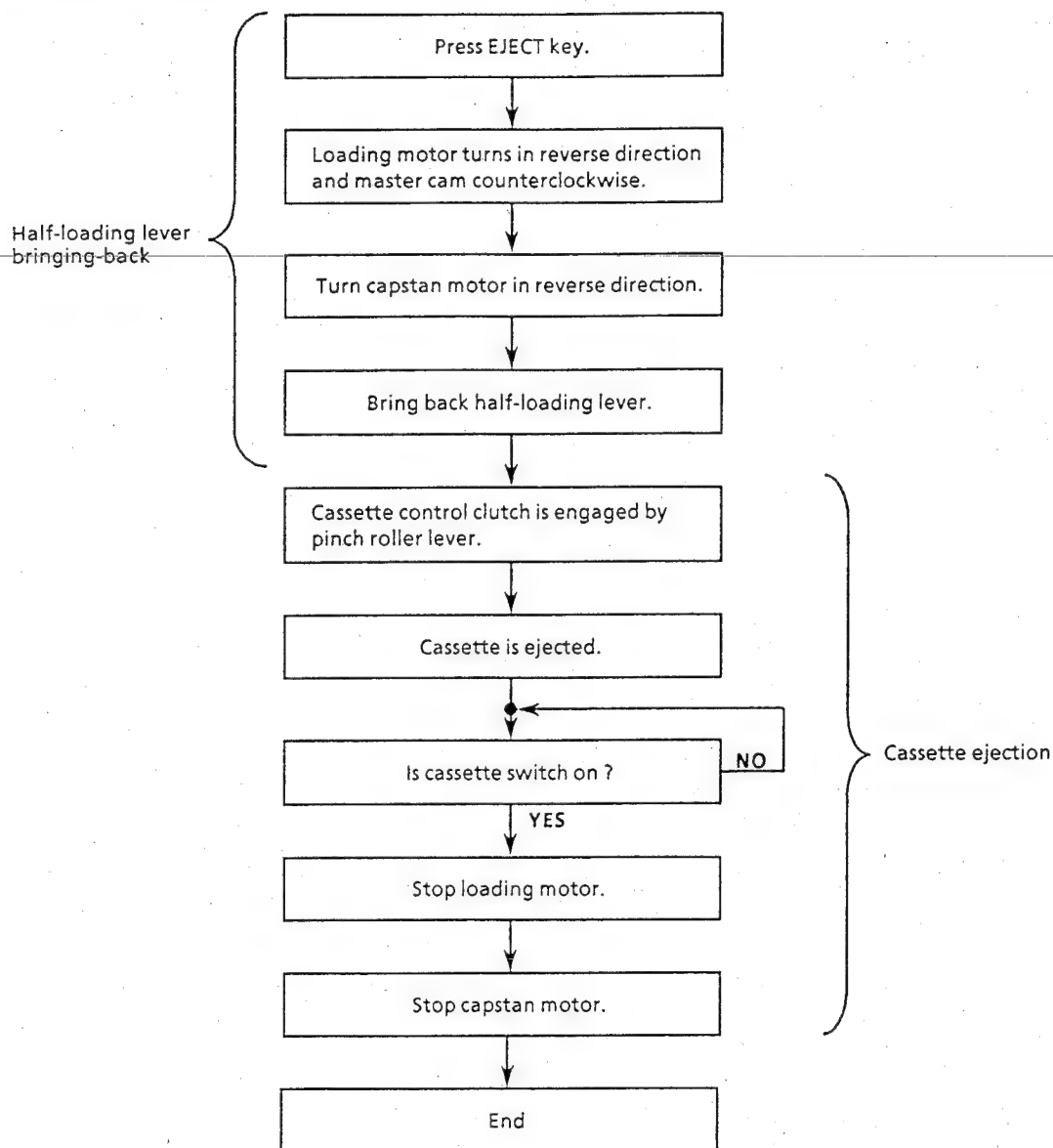
PLAY → STILLPLAY → VSF

PLAY → VSRVSR → PLAY

STOP /PLAY → STOP



STOP → FF/REWFF/REW → STOP

STOP → CASSETTE EJECT

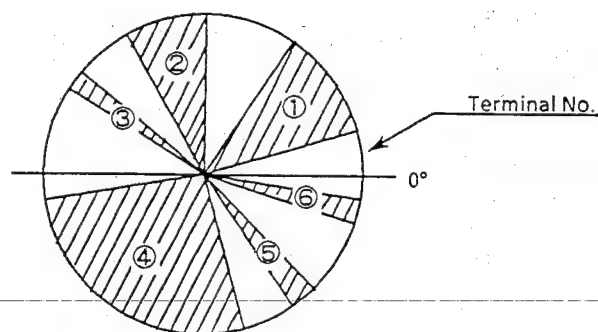


Fig. 3-1. Cam switch pattern

- * The cam switch has the pattern as shown in Fig. 3-1. The circuit turns on when the signal comes on the shaded zones on the switch. The six pattern signals are judged to be on or off by the system controller in order to detect the mechanism modes.

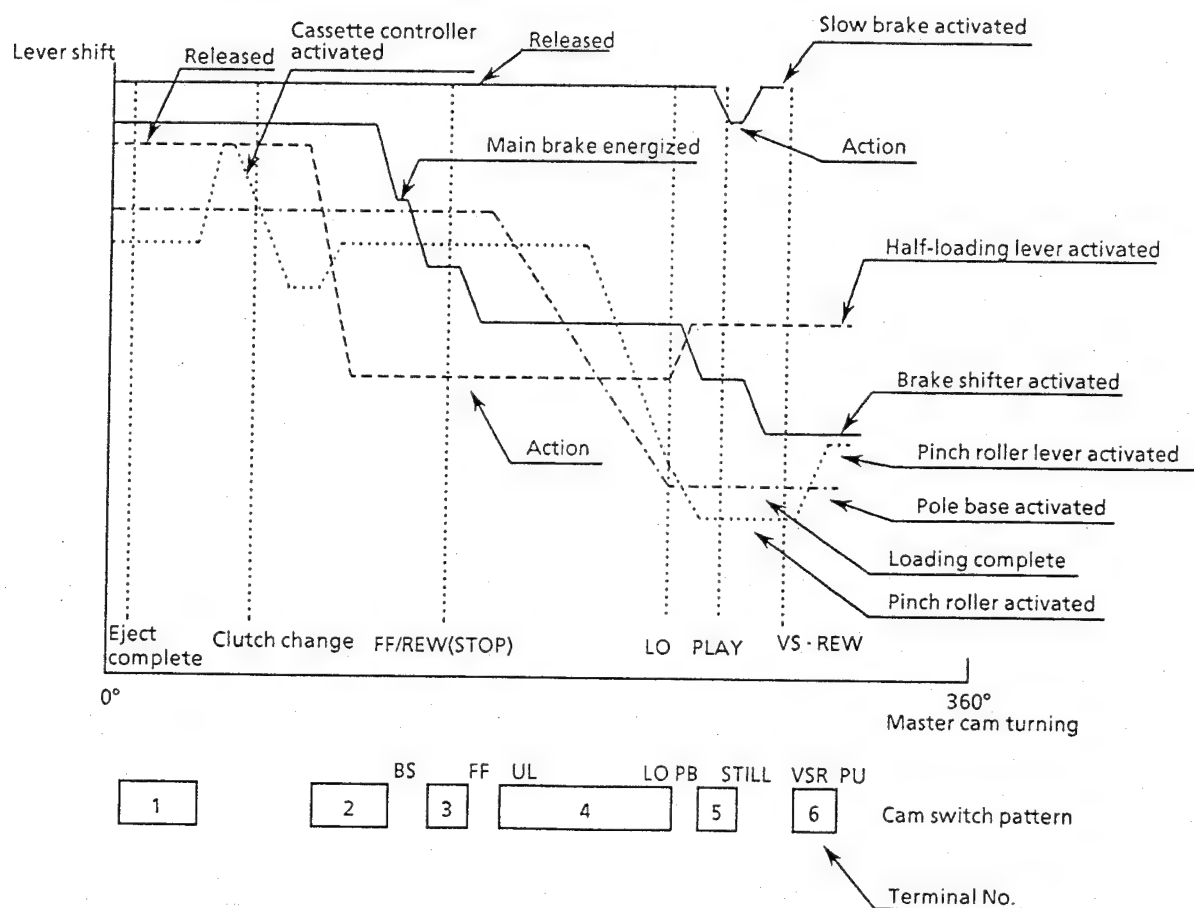
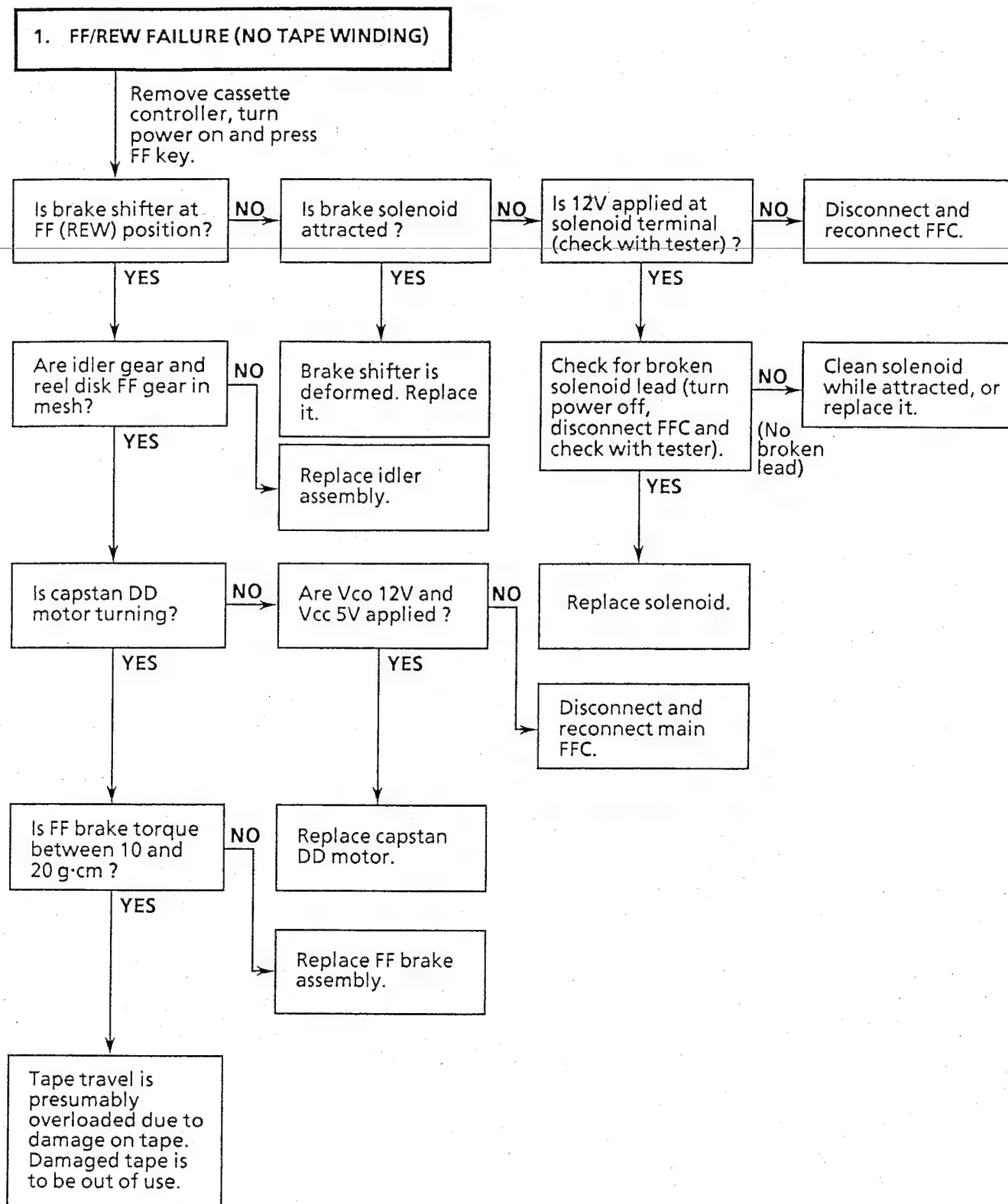


Fig. 3-2 Relationship between cam switch positions and mechanism movement

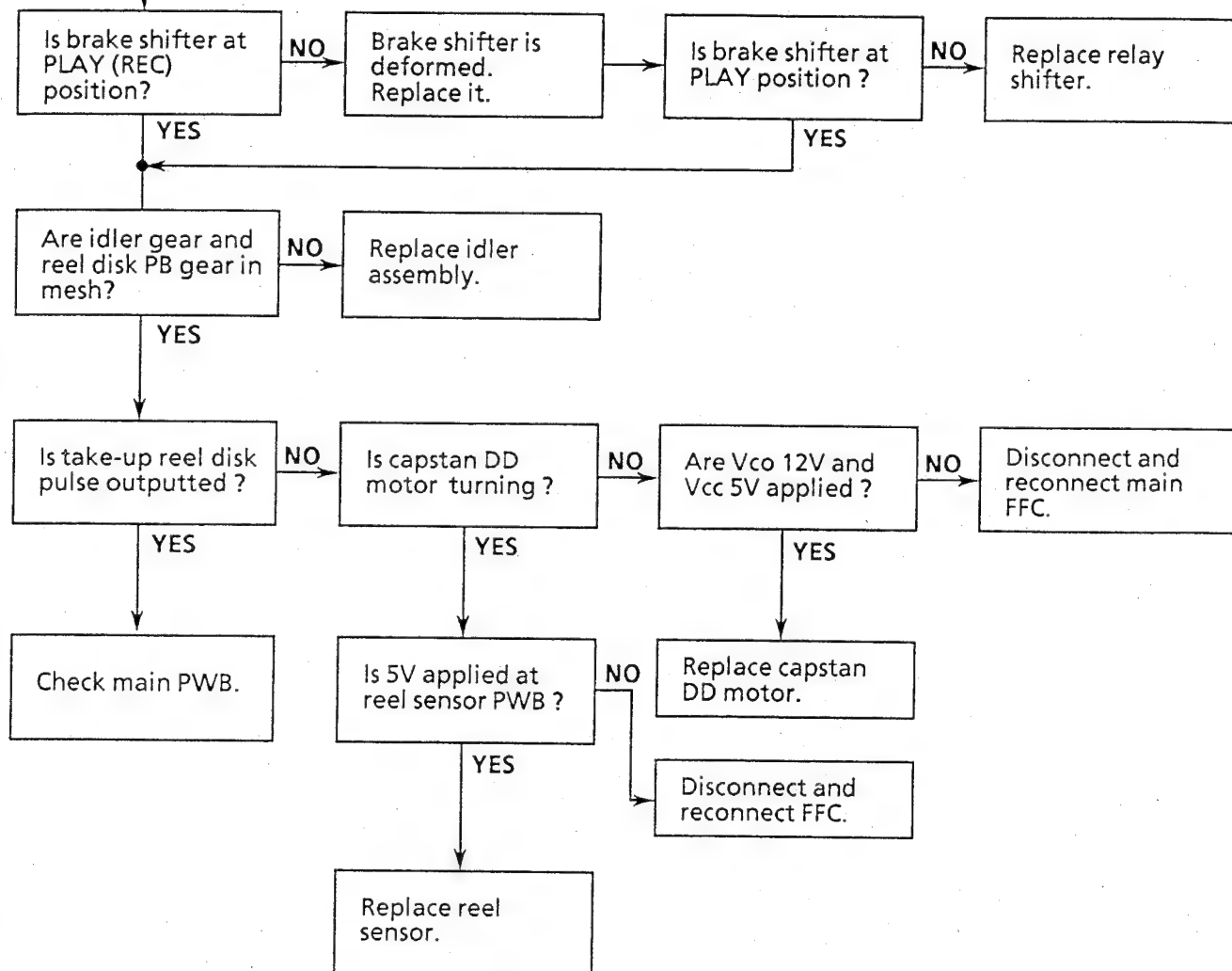
The relationship between the cam switch positions and the mechanism movement is shown in Fig. 3-2.

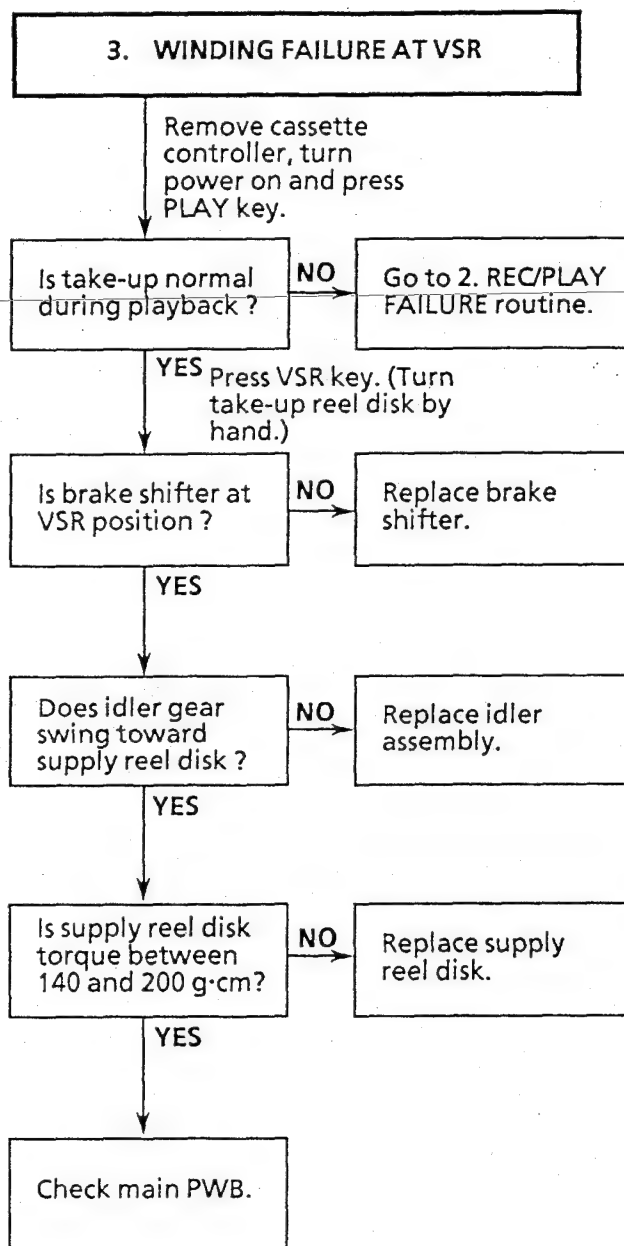
MECHANISM TROUBLESHOOTING

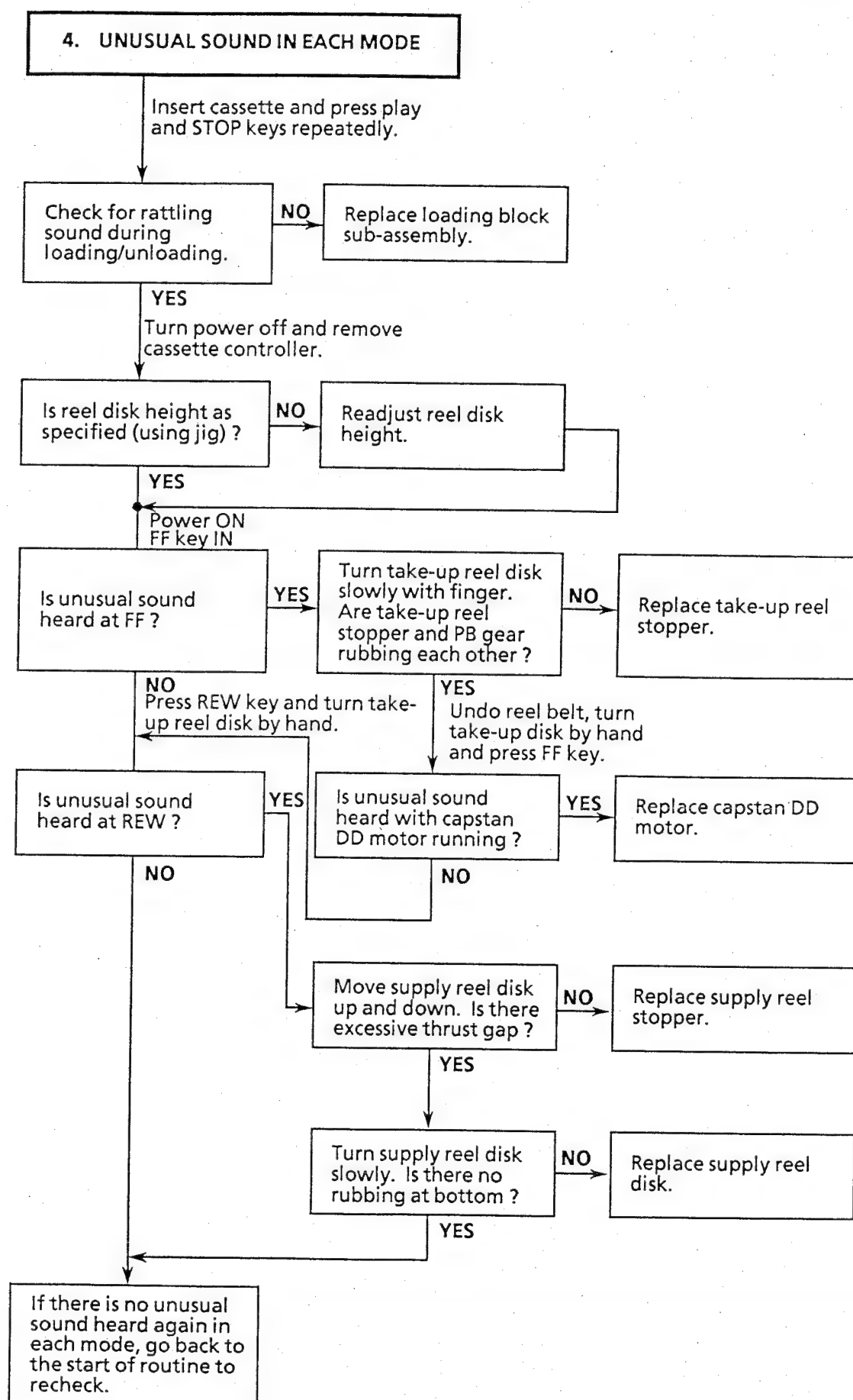


2. REC/PLAY FAILURE (MODE RELEASE)

Remove cassette controller, turn power on and press PB key.

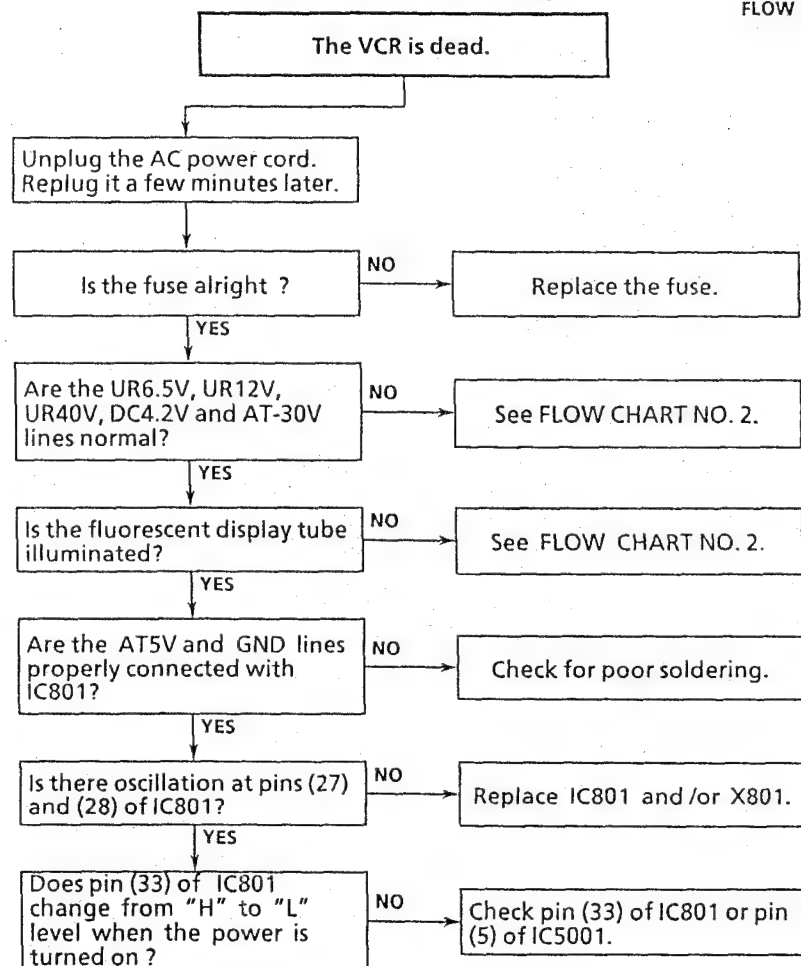






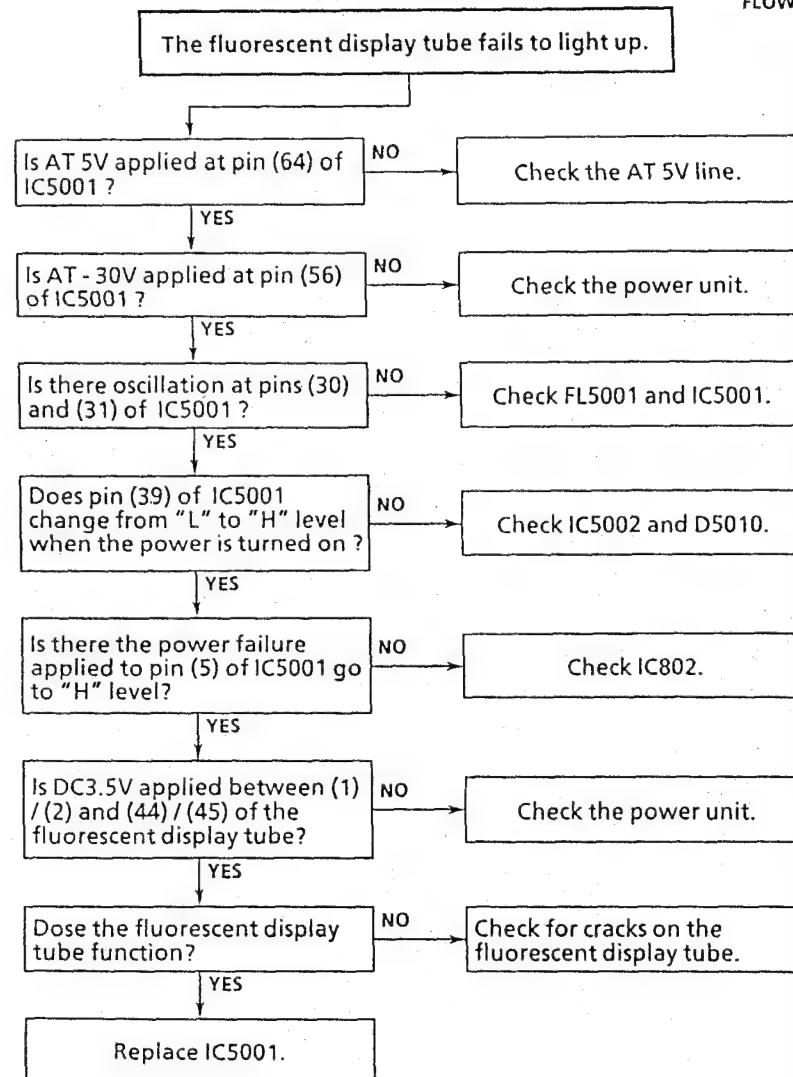
POWER TROUBLESHOOTING

FLOW CHART NO. 1



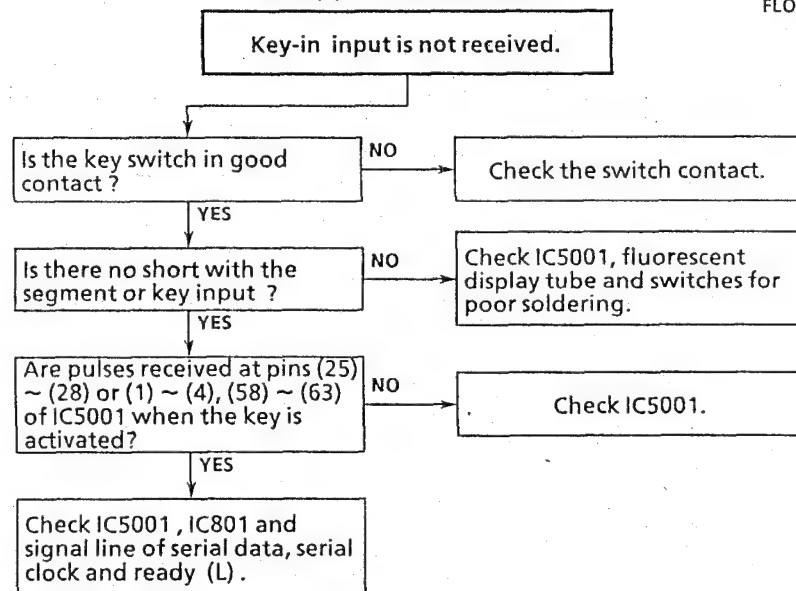
TIMER (1) TROUBLESHOOTING

FLOW CHART NO. 2



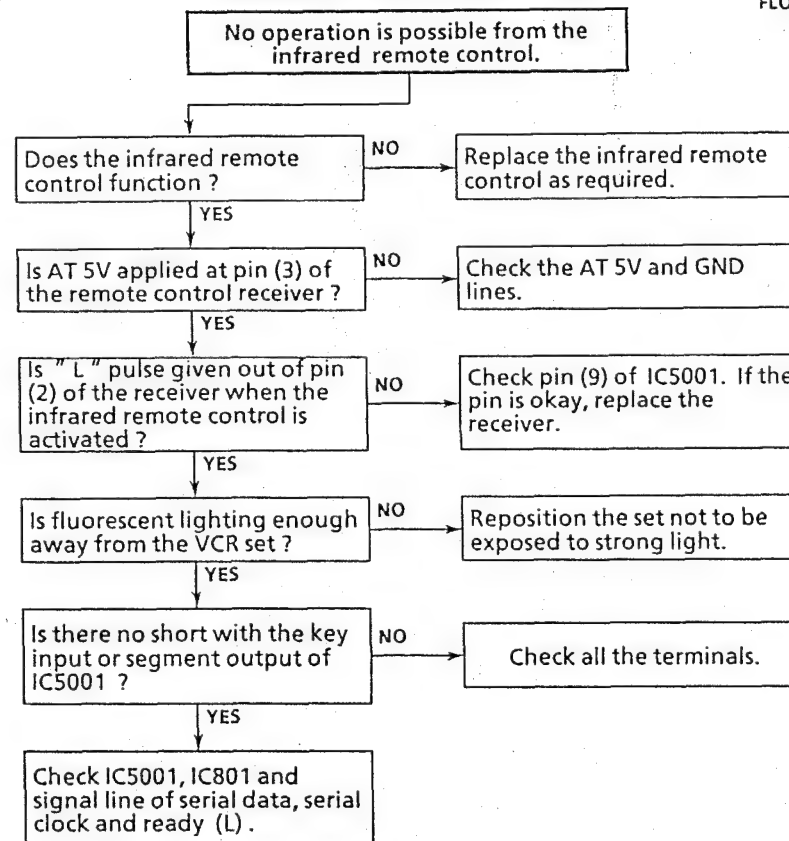
TIMER (2) TROUBLESHOOTING

FLOW CHART NO. 3



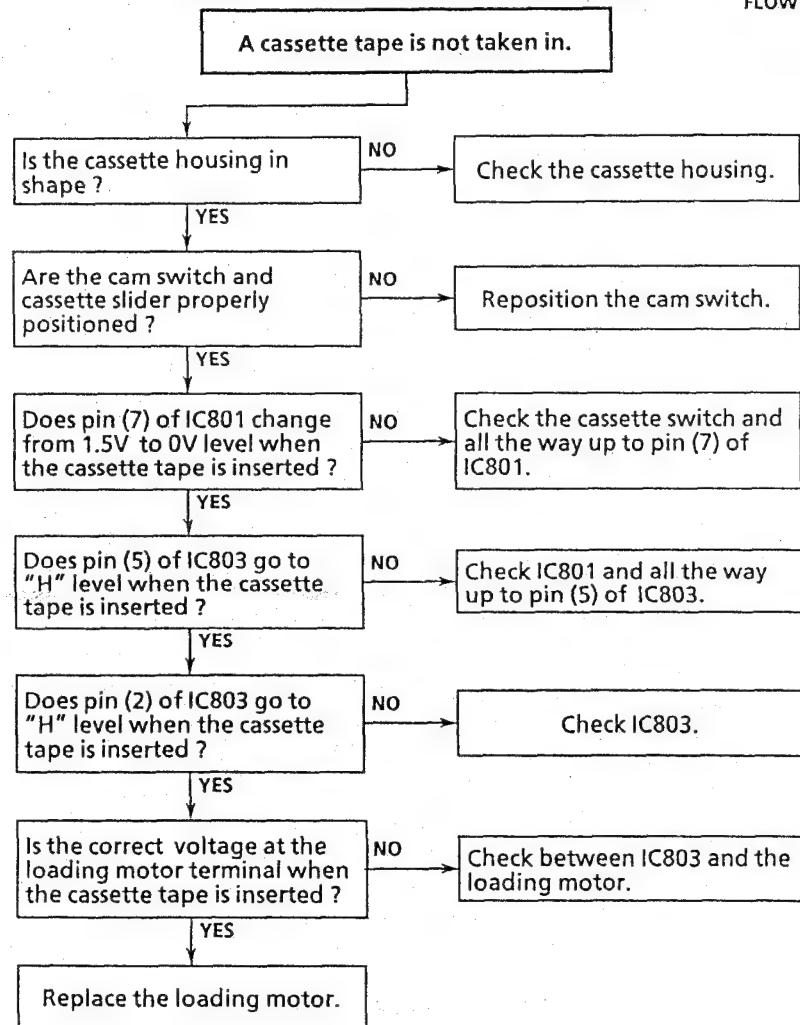
INFRARED R/C TROUBLESHOOTING

FLOW CHART NO. 4



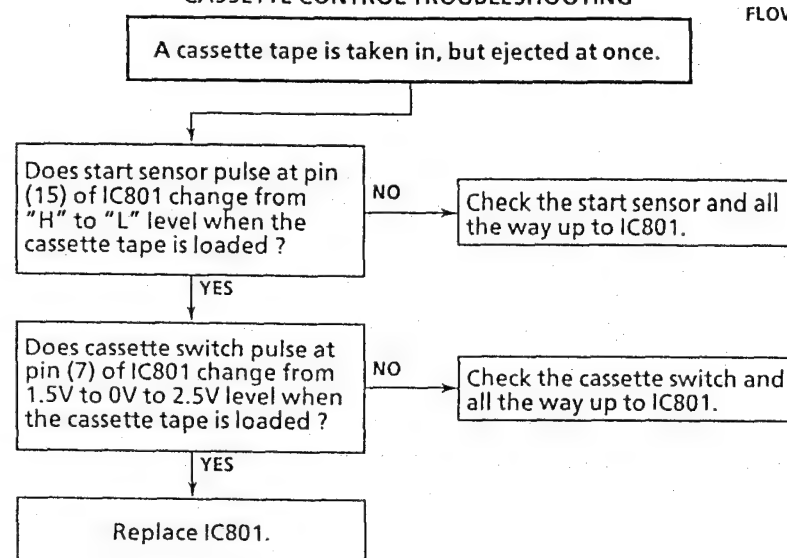
CASSETTE CONTROL TROUBLESHOOTING

FLOW CHART NO. 5



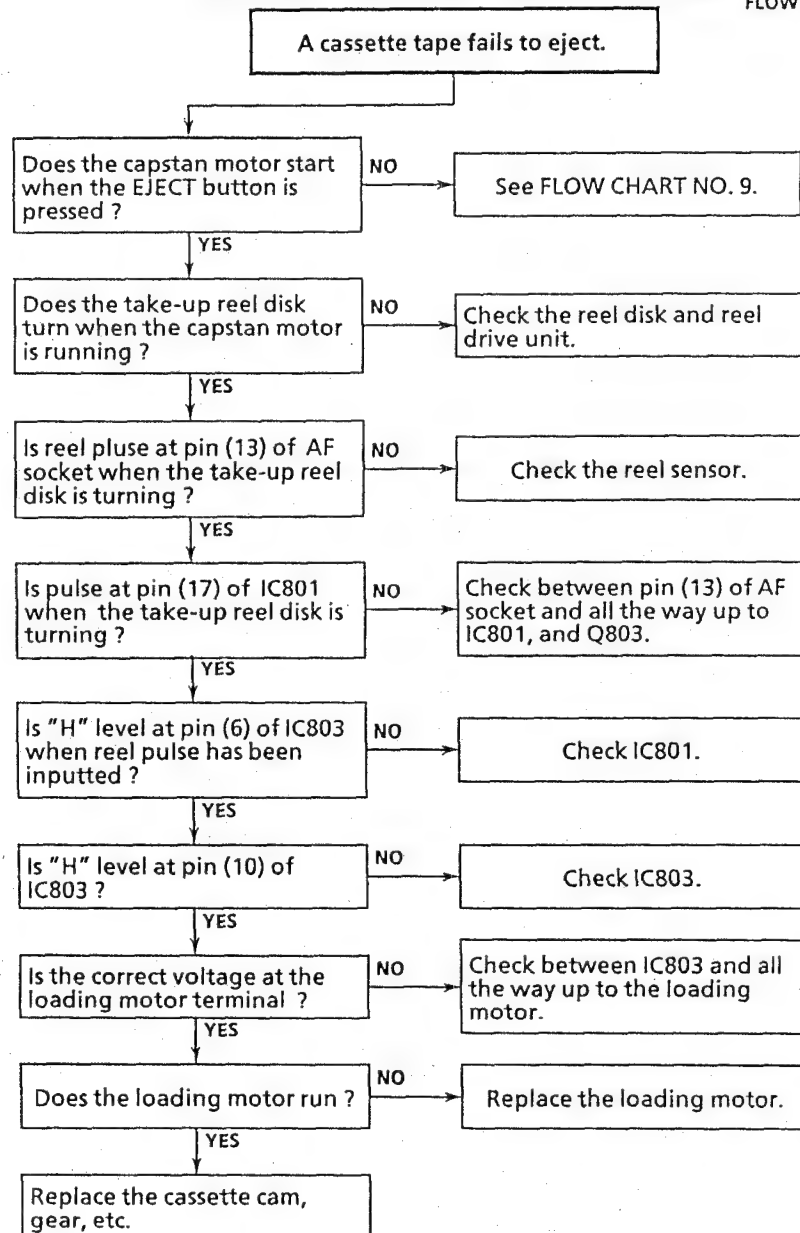
CASSETTE CONTROL TROUBLESHOOTING

FLOW CHART NO. 6



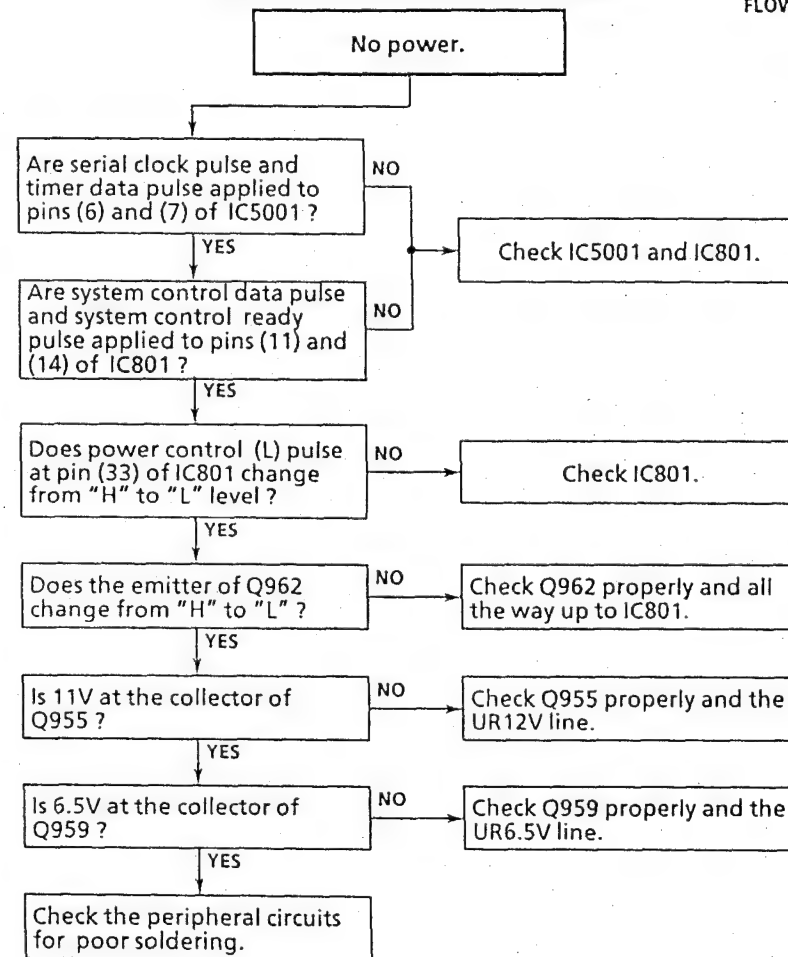
LOADING MOTOR AND EJECT TROUBLESHOOTING

FLOW CHART NO. 7



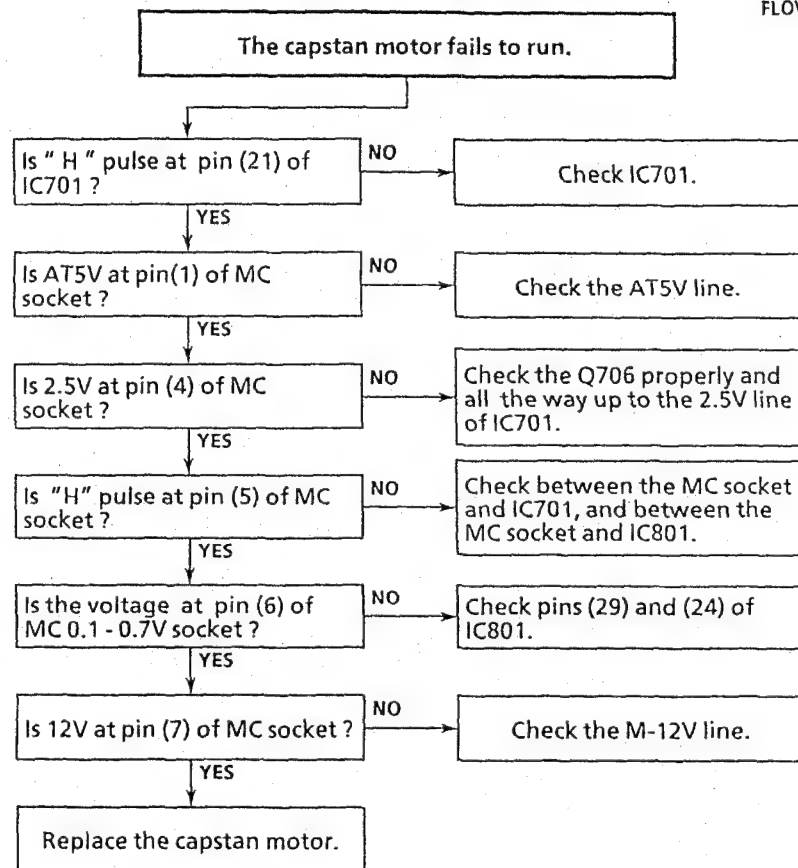
SYSTEM CONTROL TROUBLESHOOTING

FLOW CHART NO. 8



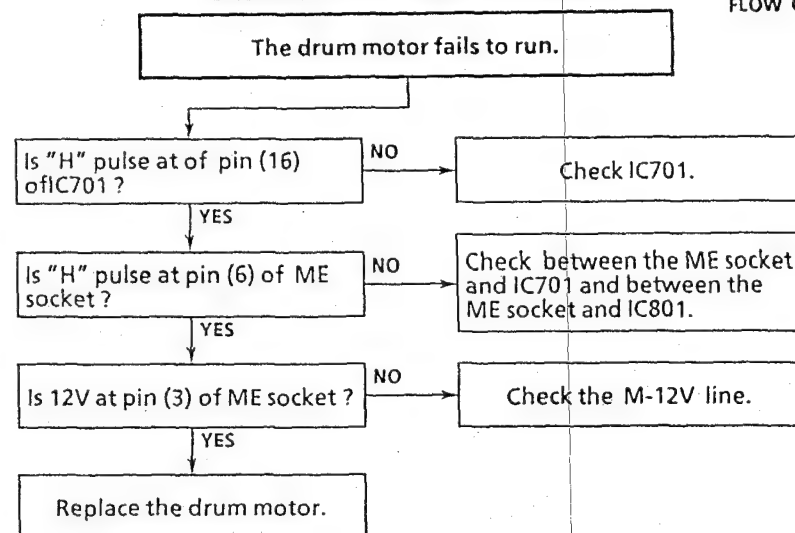
CAPSTAN MOTOR TROUBLESHOOTING

FLOW CHART NO. 9

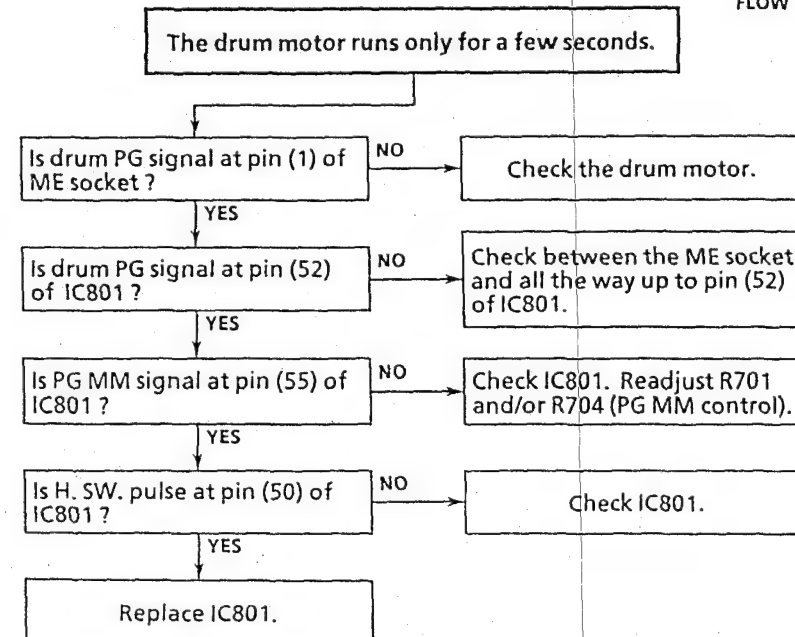


DRUM MOTOR TROUBLESHOOTING

FLOW CHART NO. 10



FLOW CHART NO. 11



DRUM SERVO TROUBLESHOOTING

FLOW CHART NO. 12

Drum servo does not function.

Is there oscillated 7.16MHz at pins (27) and (28) of IC801?

NO

Check X801, C810, C811 and R849.

YES

In PB mode

In REC mode

Is there the drum FG signal at pin (53) of IC801?

YES

Is there the reference signal (V-sync) at pin (51) of IC801?

NO

Check the V - sync signal generator in Y/C circuit and Q701.

NO

Check the signal line.

Is there the amplituded drum FG signal at pin (30) of IC701?

YES

NO

Check pin (4) of the harness ME and the drum motor.

Is there the head switching pulse at pin (50) of IC801?

NO

See FLOW CHART NO.15.

YES

Is there the drum APC output at pin (63) of IC801 and the drum AFC output at pin (62) of IC801?

NO

Replace IC801.

YES

Is there the drum control voltage applied to pin (6) of the harness ME?

NO

Is pin (21) of IC801 in high impedance?

NO

Replace IC801.

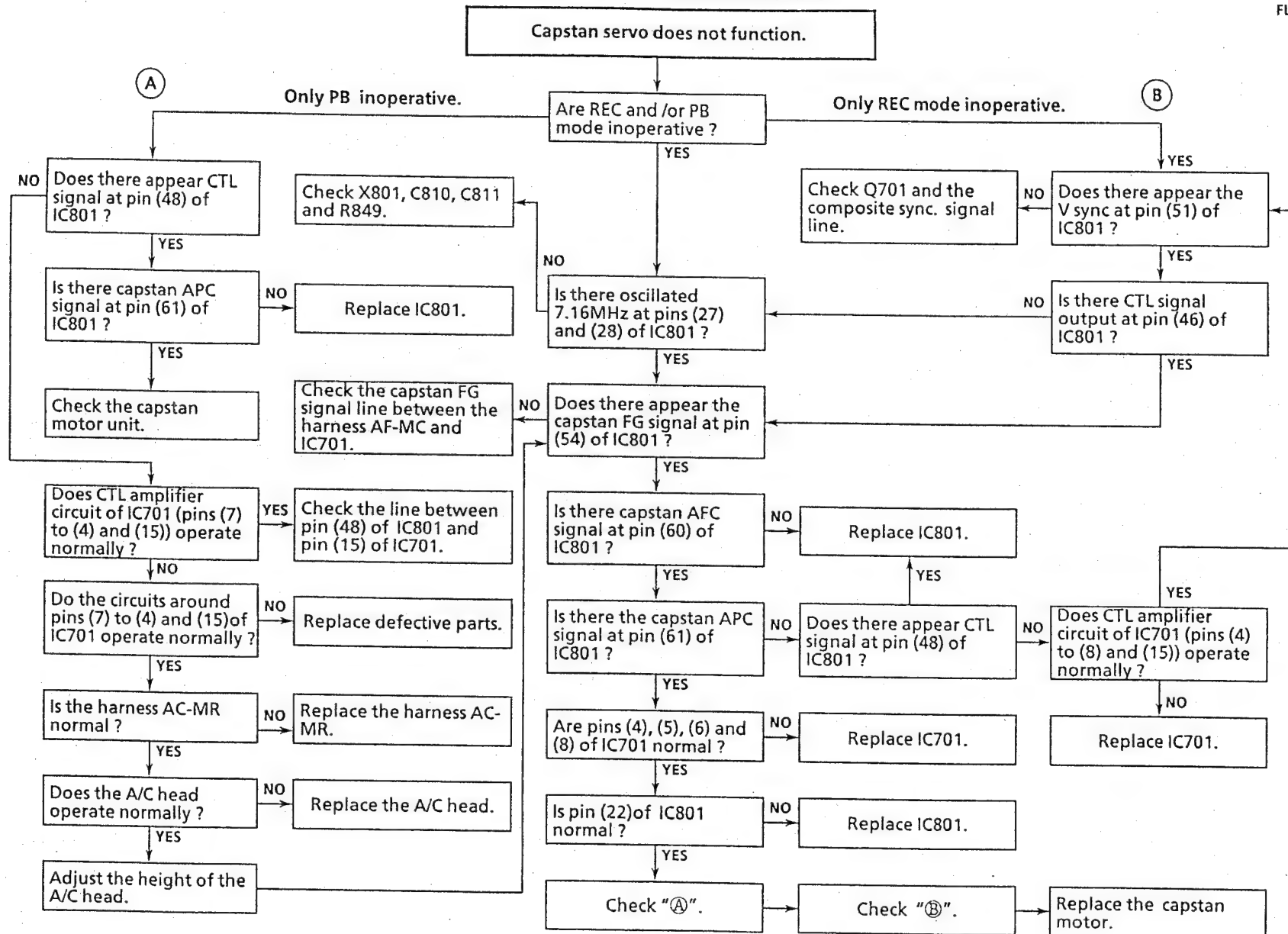
YES

Replace the drum motor.

CAPSTAN SERVO TROUBLESHOOTING

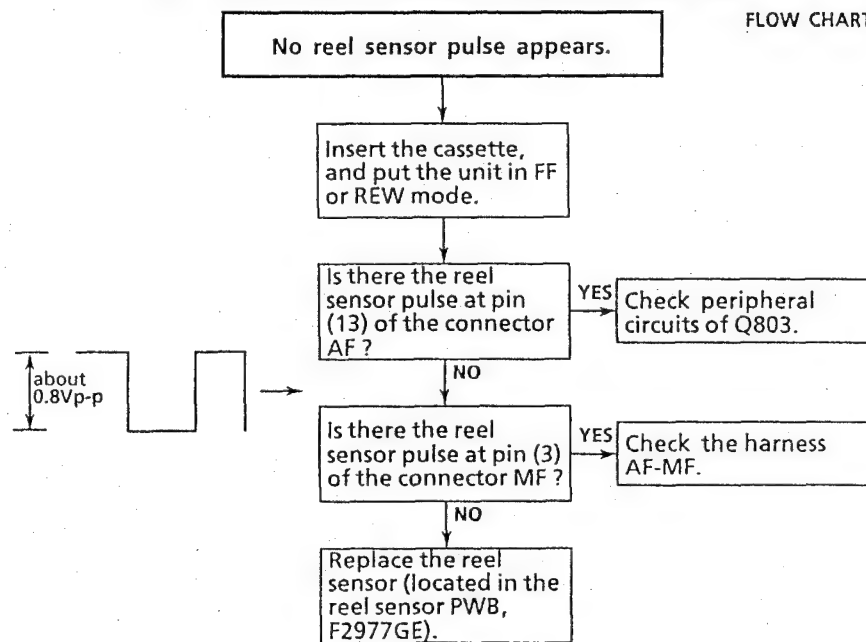
FLOW CHART NO. 13

60



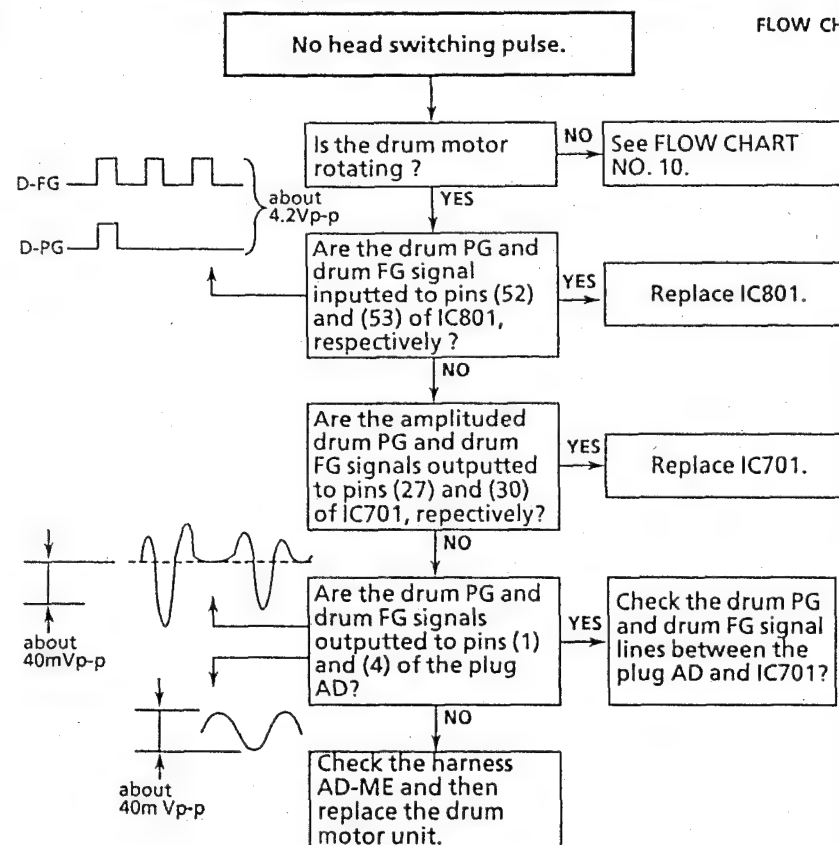
TAKE-UP REEL PULSE GENERATOR TROUBLESHOOTING

FLOW CHART NO. 14



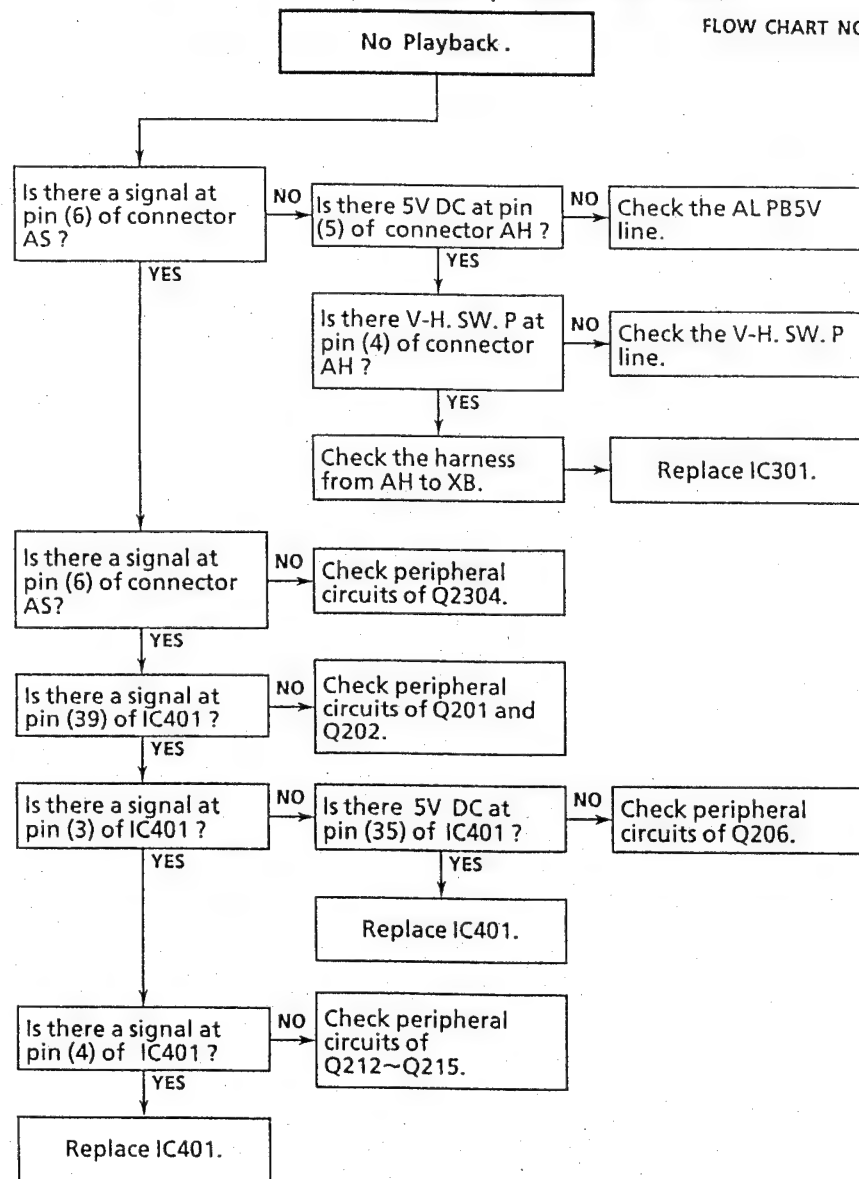
HEAD SWITCHING PULSE TROUBLESHOOTING

FLOW CHART NO. 15



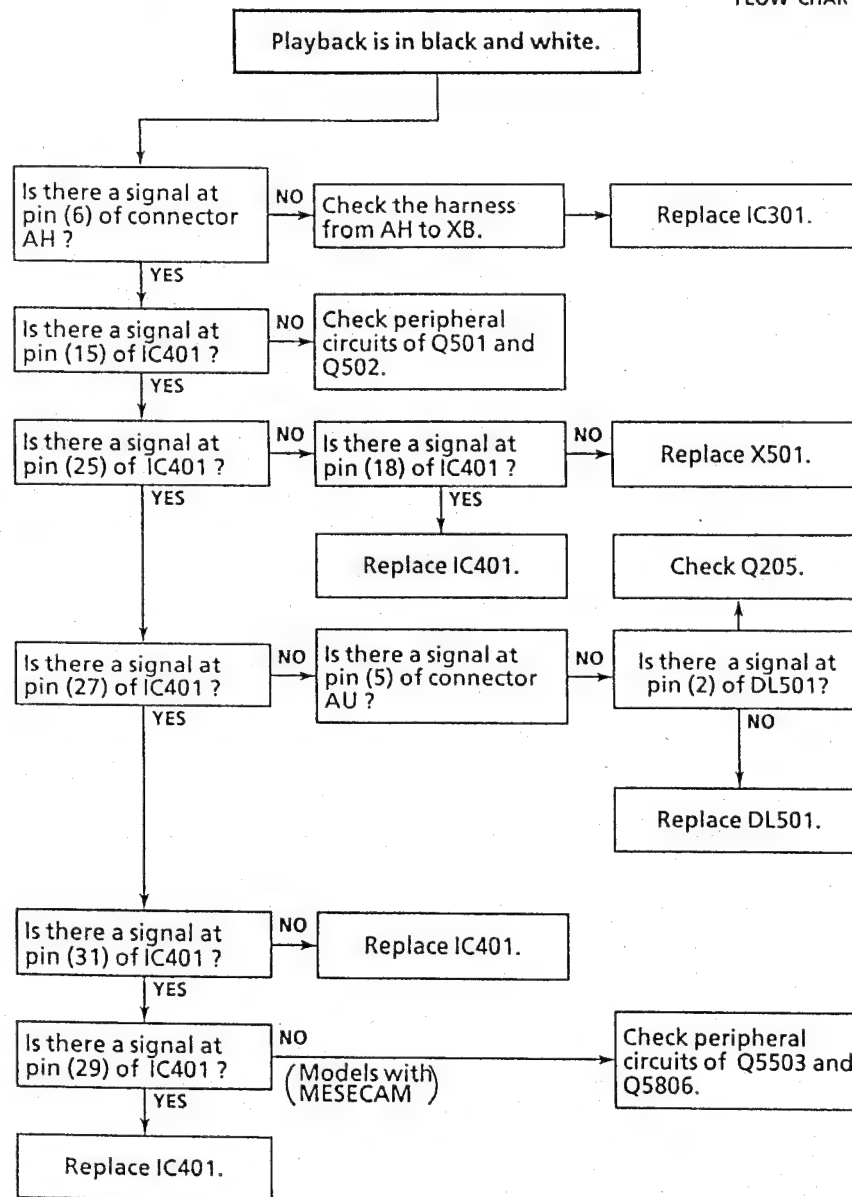
PLAYBACK MODE (LUMINANCE) TROUBLESHOOTING

FLOW CHART NO. 16



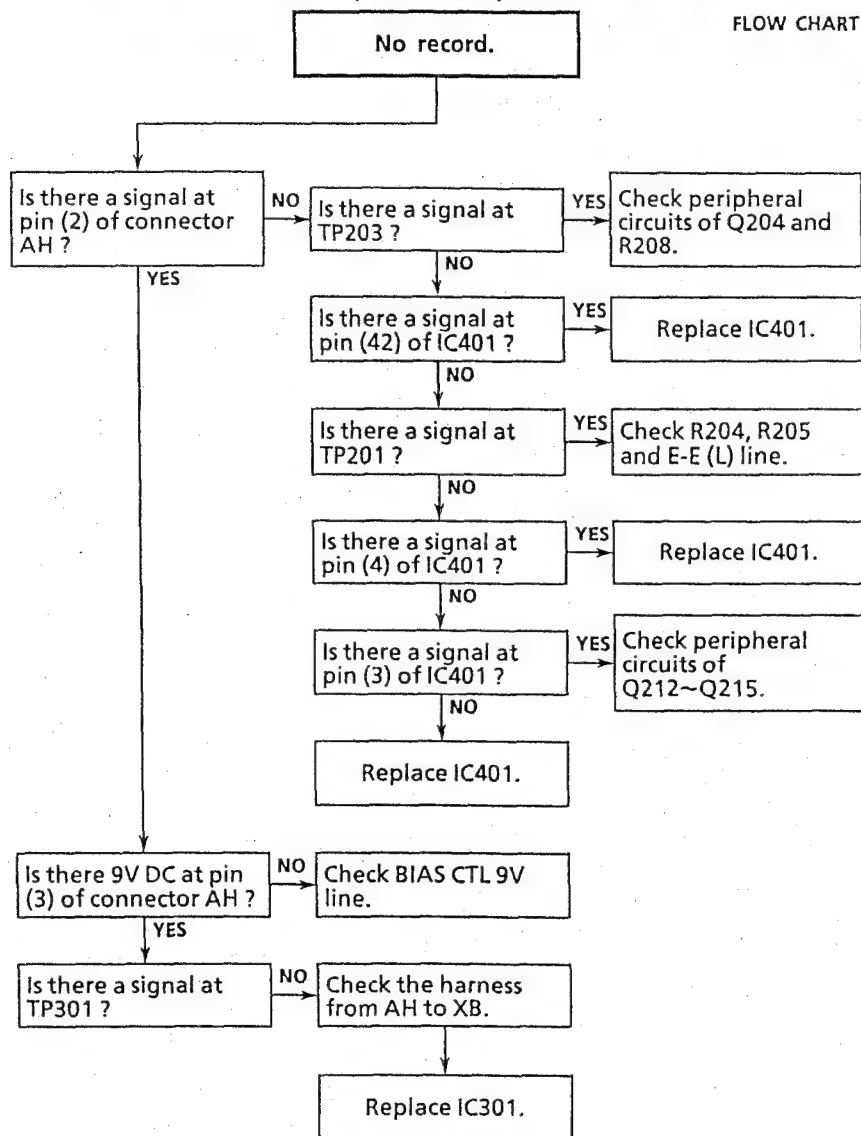
PLAYBACK MODE (CHROMINANCE) TROUBLESHOOTING

FLOW CHART NO. 17



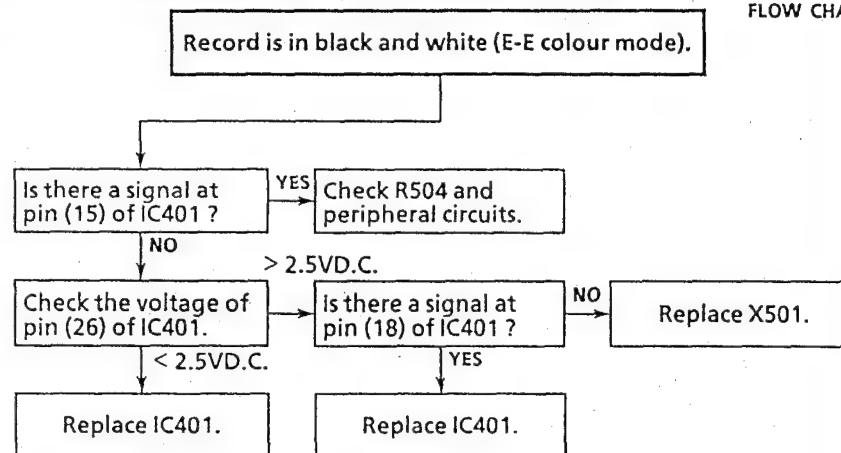
RECORDING MODE (LUMINANCE) TROUBLESHOOTING

FLOW CHART NO. 18



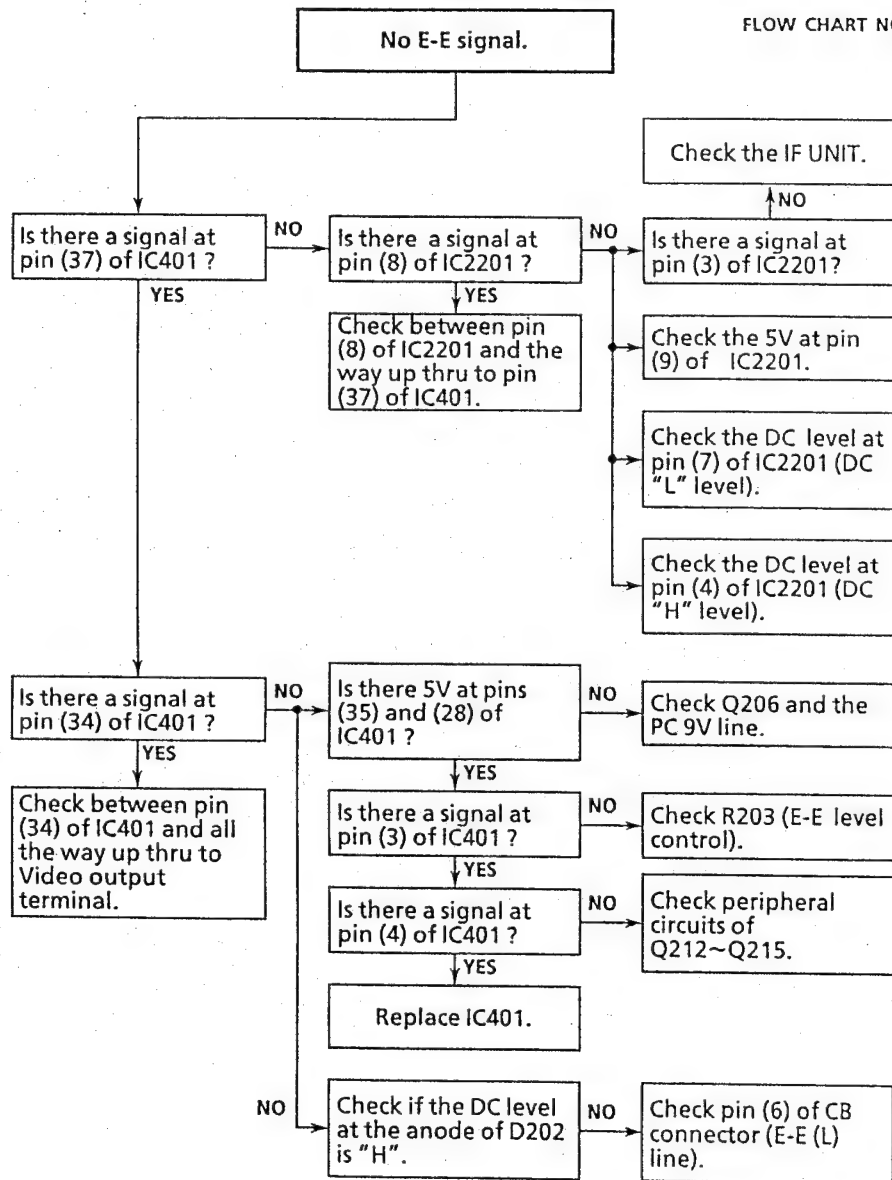
RECORDING MODE (CHROMINANCE) TROUBLESHOOTING

FLOW CHART NO. 19



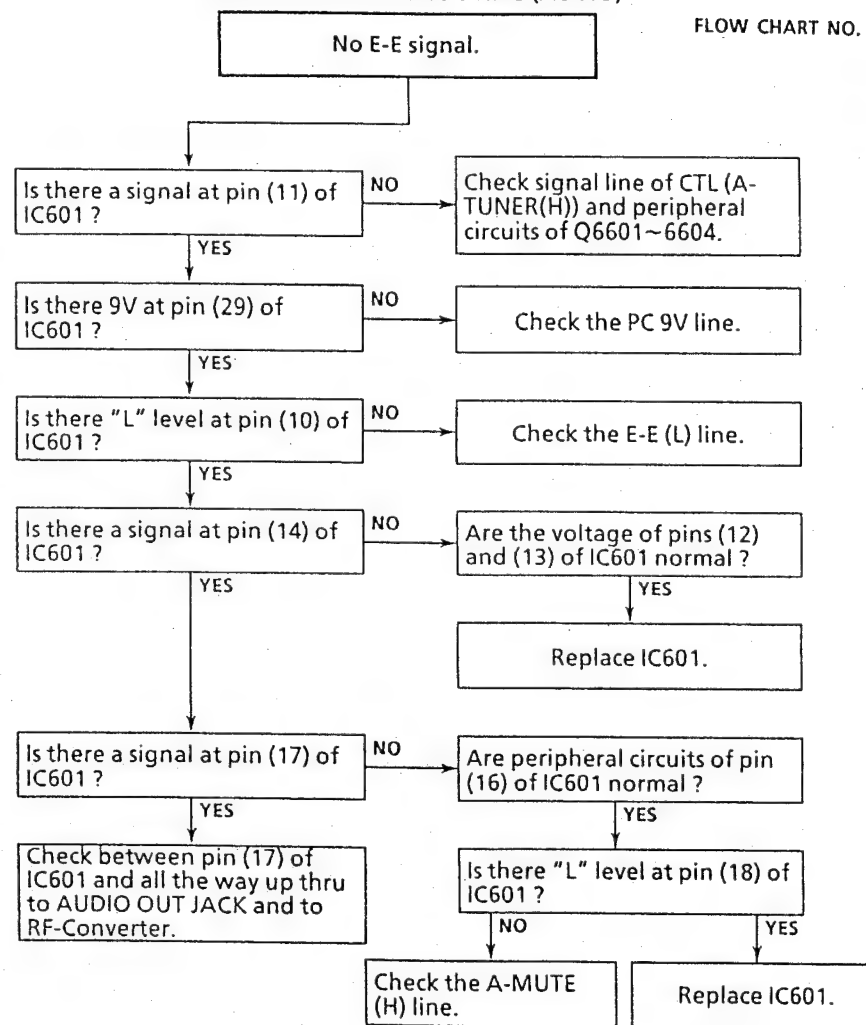
E-E MODE TROUBLESHOOTING

FLOW CHART NO. 20



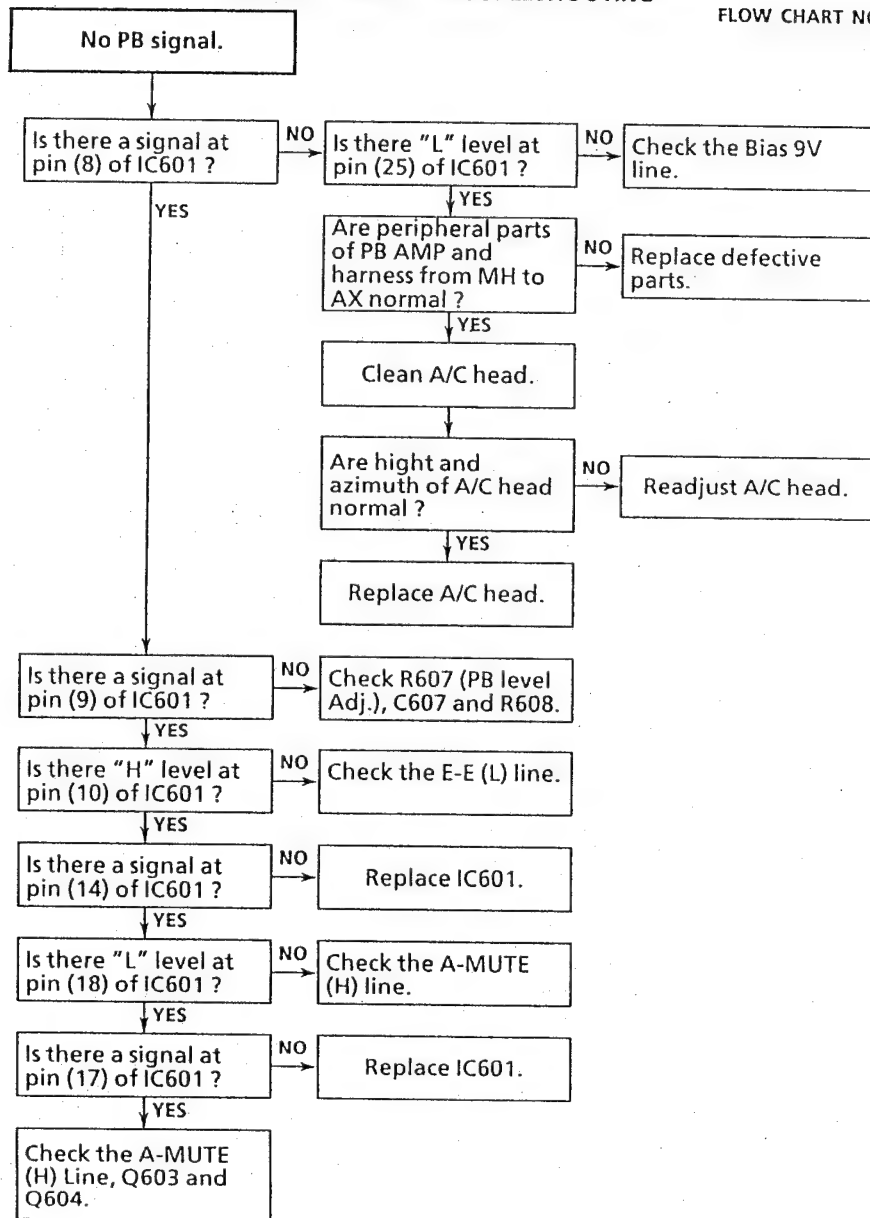
E-E MODE TROUBLESHOOTING (AUDIO)

FLOW CHART NO. 21



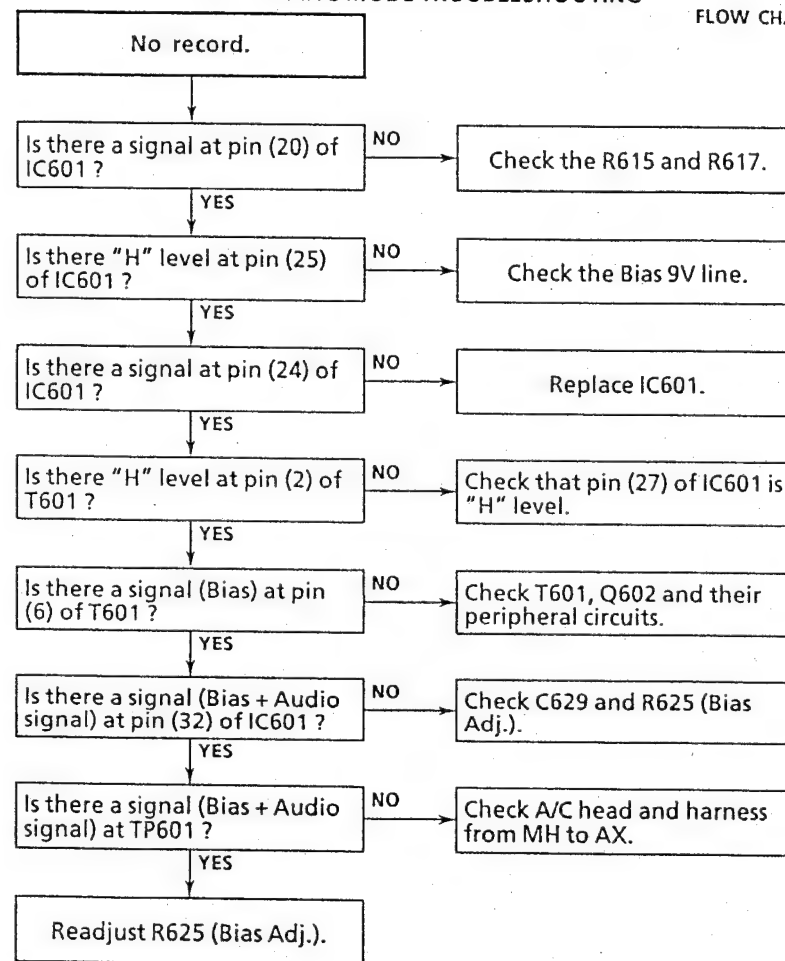
PLAYBACK MODE TROUBLESHOOTING

FLOW CHART NO. 22



RECORDING MODE TROUBLESHOOTING

FLOW CHART NO. 23



TROUBLESHOOTING FOR NTSC→PSEUDO PAL CONVERSION ARTIFICIAL CIRCUIT

CONVERSION from NTSC to PSEUDO PAL mode. No colour appears on PAL monitor at playback.

Is pin (13) of IC5501 at "L"?

NO

Check Q5504 and its peripheral circuits.

YES

Is burst gate pulse stably fed to pin (9) of IC5501?

NO

Is c-sync signal stably fed to pin (2) of IC5501?

YES

Check waveforms at pins (2) thru (8) of IC5501 and its peripheral circuits. Check also R5516 and related IC for mal-adjustment and defect.

NO

Check IC401 on the Y/C PWB and C-sync signal line.

YES

Is playback chroma signal fed to pin (14) of IC5501?

NO

Check chroma circuit on Y/C PWB.

YES

Is burst signal fed to pins (19) and (20) of IC5501?

NO

Check pins (15) thru (20) of IC5501 and its peripheral circuits.

YES

Playback NTSC colour bar tape. Is chroma signal fed to pin (11) of IC5501 as shown in the wave.

NO

Check IC5501 for defect.

YES

Check Q5503 and its peripheral circuits.

Switch from NTSC to PAL mode. Being out of vertical sync, reproduced image is shaky.

Is image stable on multi-system or NTSC monitor?

NO

Check servo circuit.

YES

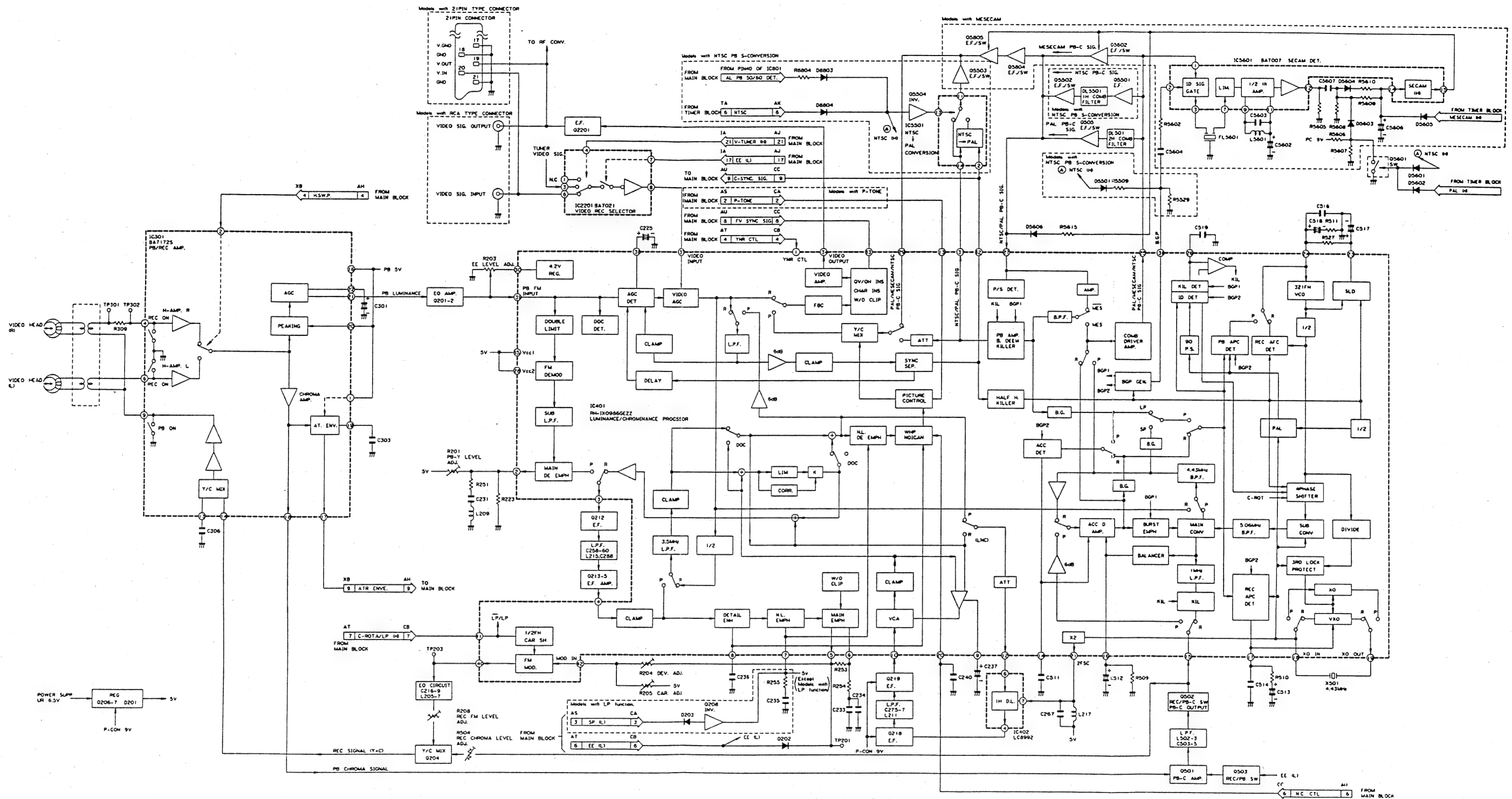
Image may be out of sync and shrink vertically depending on monitors.

Not compatible

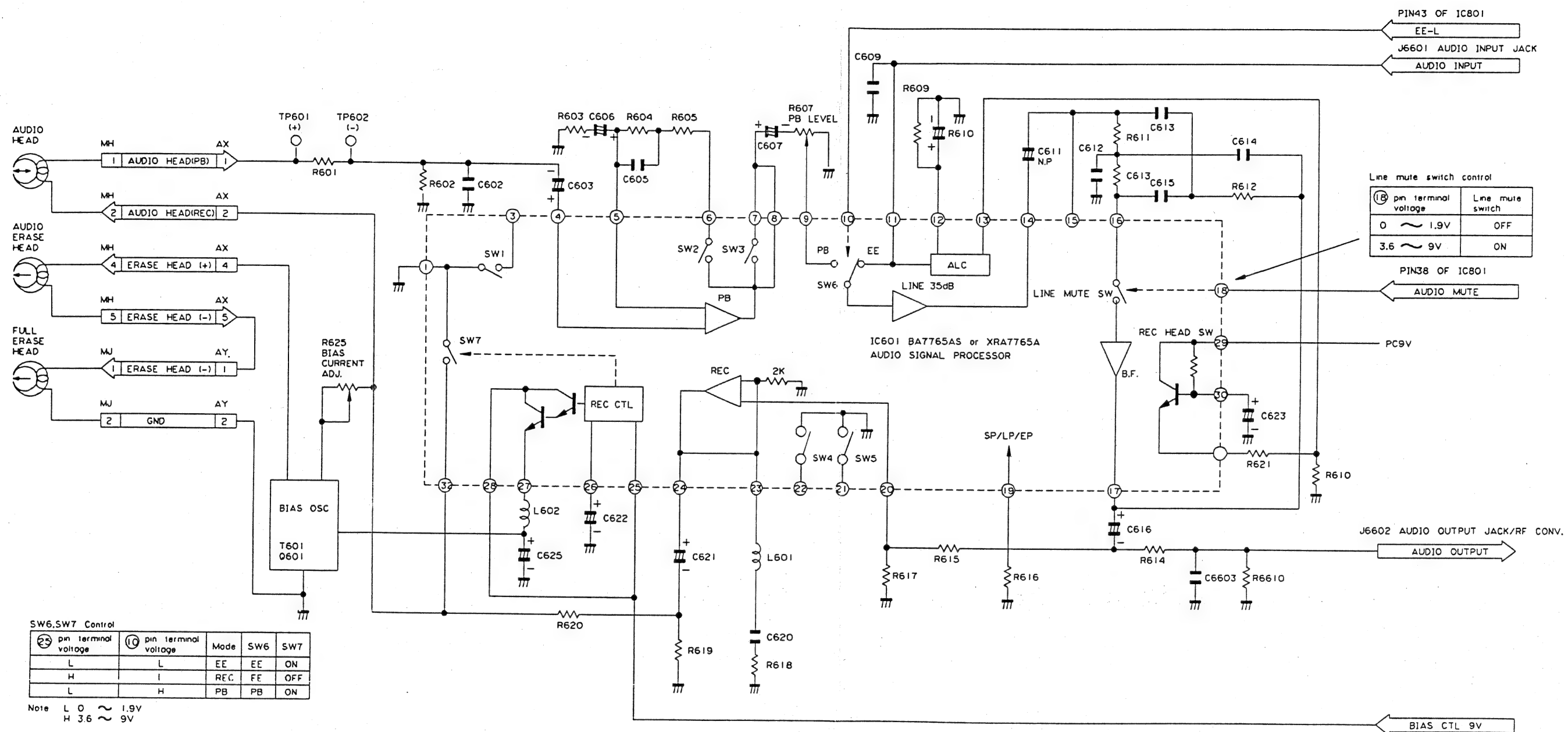
VCR function well.

For poor vertical sync, readjust CTV set's V-HOLD control.

SIGNAL FLOW BLOCK DIAGRAM



AUDIO BLOCK DIAGRAM



REPLACEMENT OF TIMER IC5003 (E²PROM)

Servicing precautions

When the IC5003 E²PROM (VHIBR93C46A-1, VHIXRM9346A-1 or VHICAT93C46-1) in the timer unit has been replaced, make the following reprogramming.

Depending on models, the IC5003 E²PROM has been factory-adjusted for its memory function. It is therefore necessary to reprogram the memory function for the model in question. Note that the servo circuit requires readjustments for the slow and still modes.

Memory function reprogramming

1. Push the OPERATE button to turn the power on.
2. Press the TEST button on the timer PWB to get the unit in the TEST mode.
3. Push the CH SET button to get the unit in the CH SET mode.
4. Using the CHANNEL (+) AND (-) buttons, select the right function numbers from among 148-163, which appear in the fluorescent display tube, referring to the E²PROM map. Push the DISPLAY button to pick up the functions (ON) and the CLEAR button to discard the functions (OFF).
 - * When the DISPLAY button has been pushed (ON), the memory function No. starts flashing.
 - * When the CLEAR button has been pushed (OFF), the memory function No. lights up.
5. Press the CH SET button to clear the CH SET mode.
6. Make the cathode of the timer D5004 and TJ203 on timer PWB short circuited, and the settings will be displayed in hexadecimal notation. Now you can see if the settings are correct.

Example:

"ON" and "OFF" are taken as "1" and "0" respectively. The numbers 148 to 163 are divided into four groups and each group's setting is displayed in hexadecimal notation.

163	162	161	160	159	158	157	156	155	154	153	152	151	150	149	148
0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
↓				↓				↓				↓			
4				2				0				0			

"4200" appears in the fluorescent display tube.

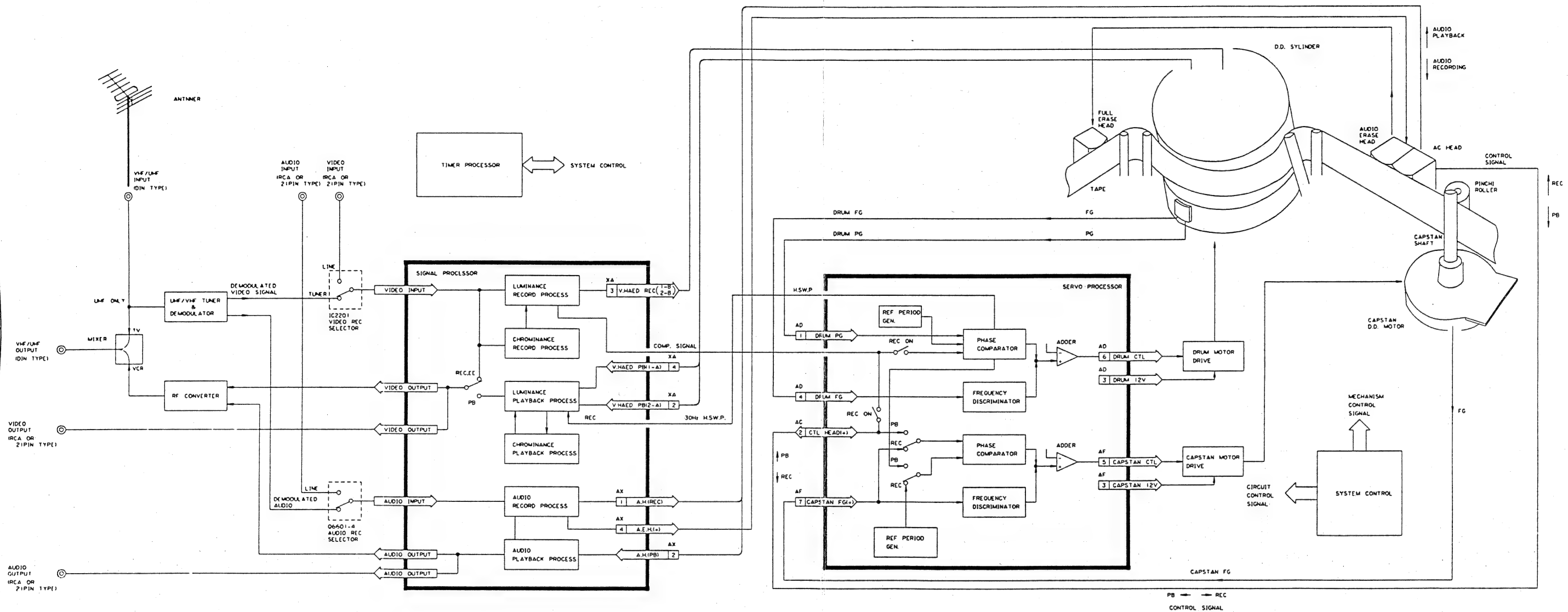
7. Finally push the ALC button to clear the TEST mode.

E²PROM map

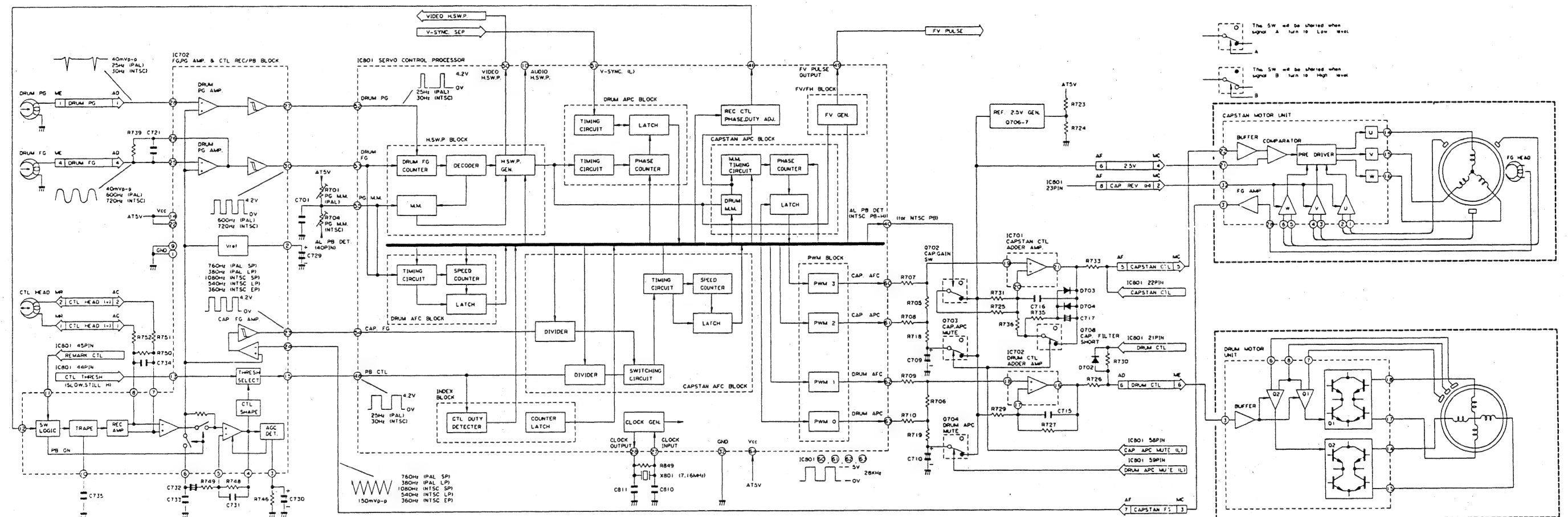
Fun No	Function name														
163	I ² C														
162	SIMUL	○	○	○	○	○	○	○	○	○	○	○	○	○	○
161	MULTI														
160	OEM					○						○	○		
159	COLOUR2					○						○			
158	COLOUR1					○						○			
157	COLOUR0	○	○	○	○		○	○	○	○	○	○		○	○
156	GERMANY														
155	AUX2														
154	HYPER			○							○	○			
153	UHF						○		○					○	
152	FRENCH														
151	LP							○	○	○	○	○	○	○	○
150	VPS		○	○						○	○				
149	Hi-Fi														
148	VCR				○										○
Displayed on screen		4200	4204	4244	4201	5C00	4220	4208	4228	420C	424C	4248	5C08	5228	4209
MODEL'S (VC-)		A43S A43SM A33X A38X A43X A33BP A43YM A33LM	A43GM A265 GM	A43SV	A33NZ A38NZ	B34N B35D B36B	A33HM A43HM	A48X A63X A53SM A63YM A63BP A53YM	A48HM A63HM	A53GM	A63SV A63GM	A63S A63SM	B67NT B78DT B68BTN	B66WT	A63NZ

Note: "○" : ON " " : OFF

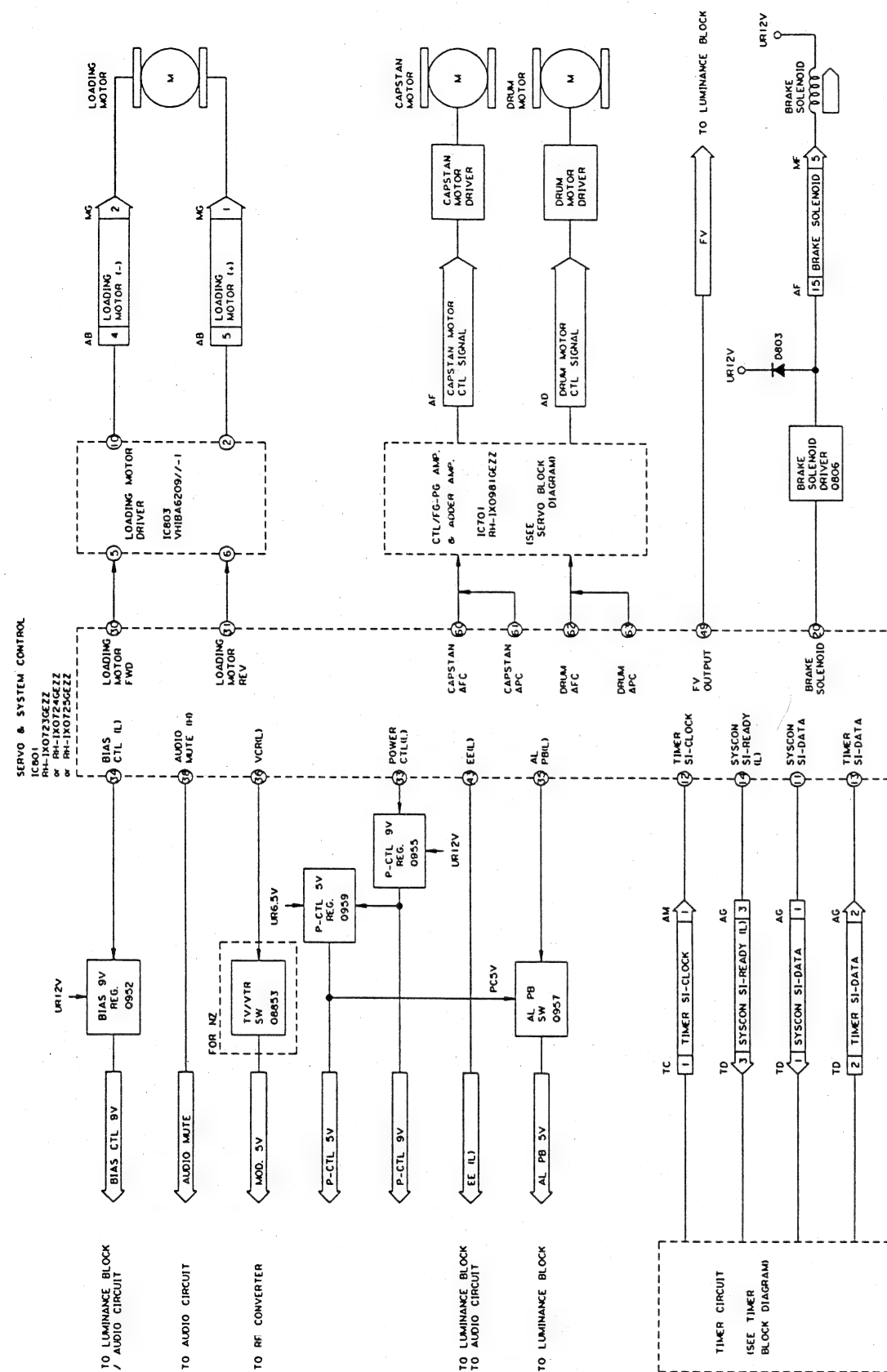
OVERALL BLOCK DIAGRAM



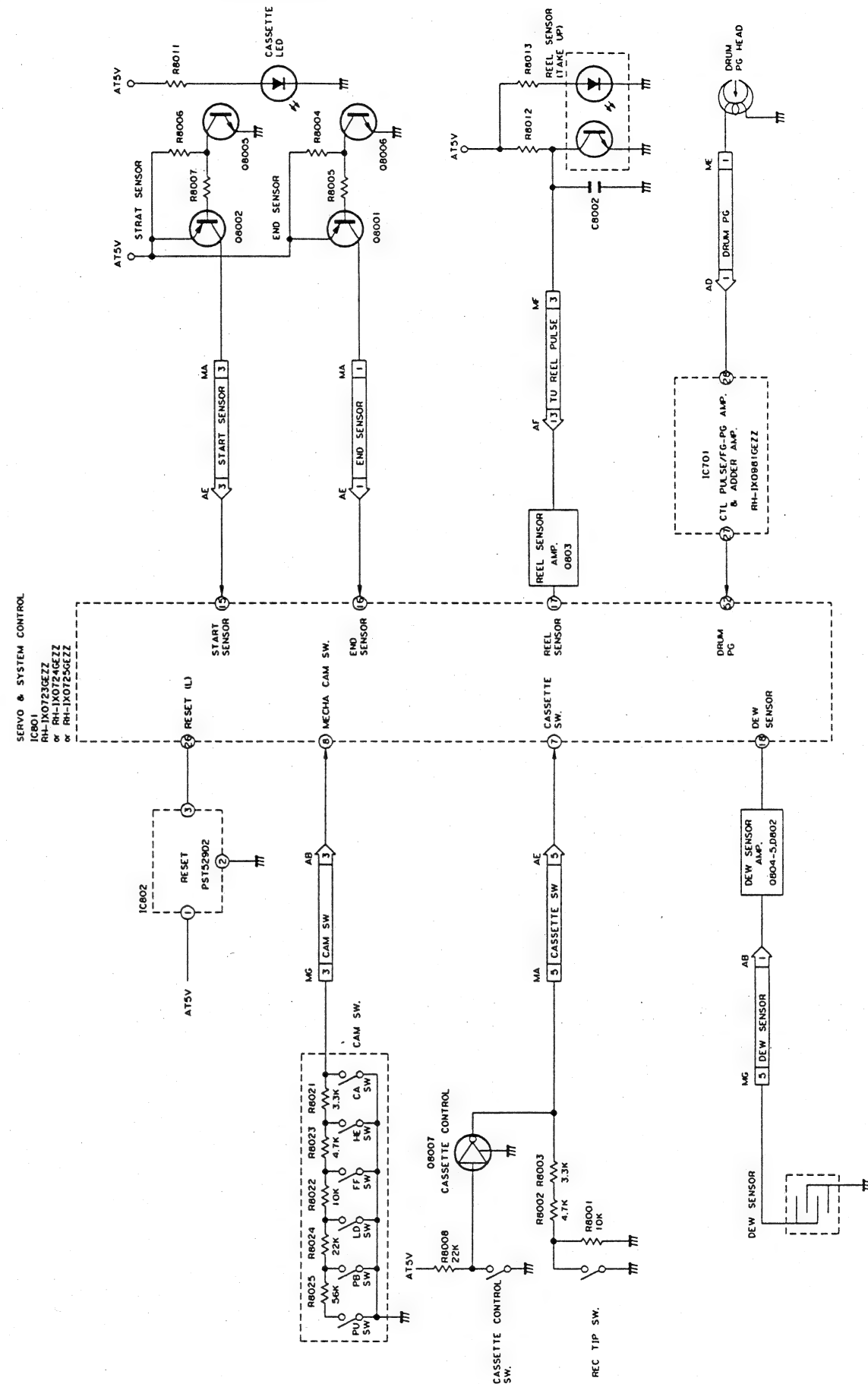
SERVO PROCESS BLOCK DIAGRAM



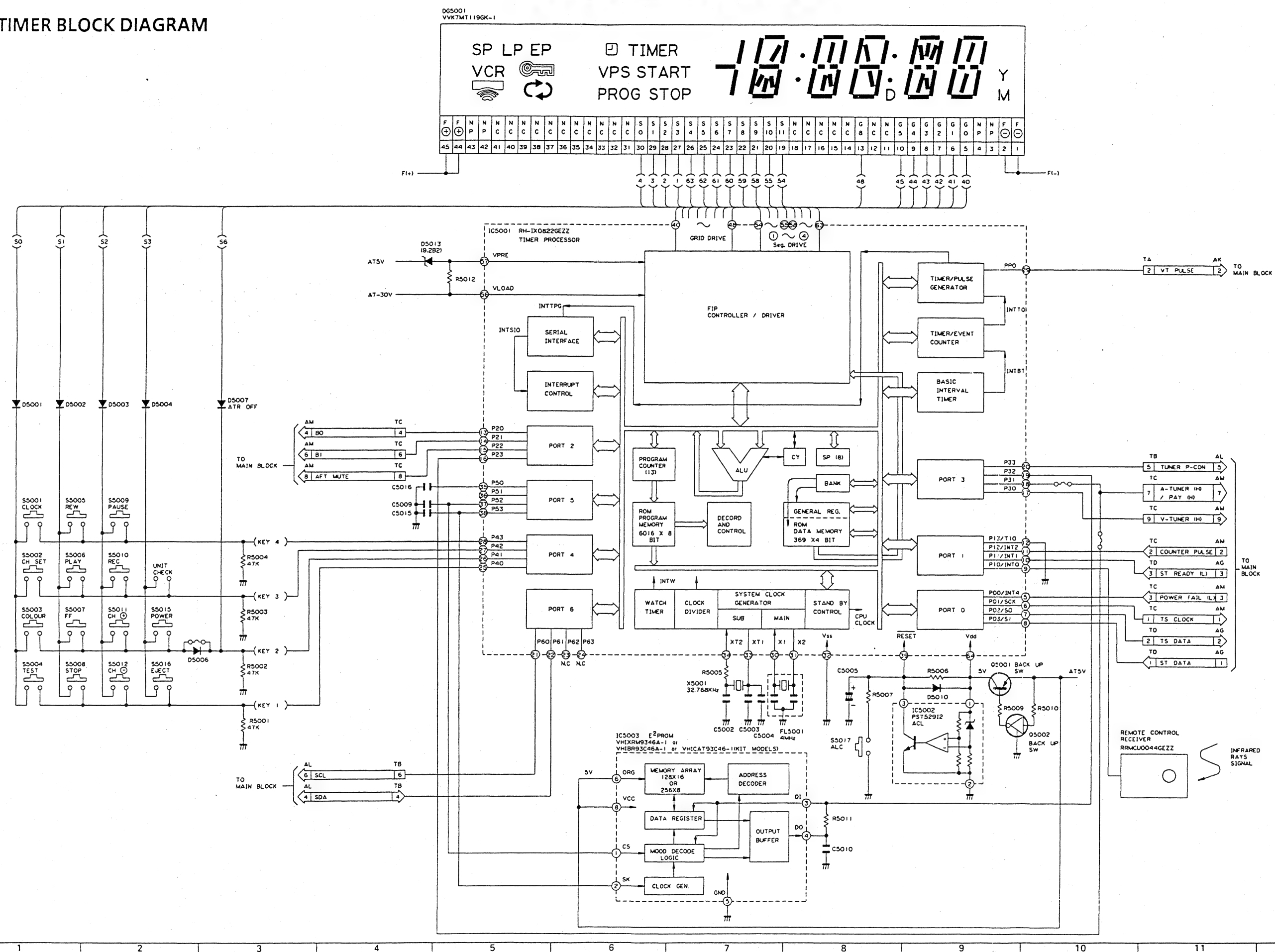
SYSTEM CONTROL BLOCK DIAGRAM



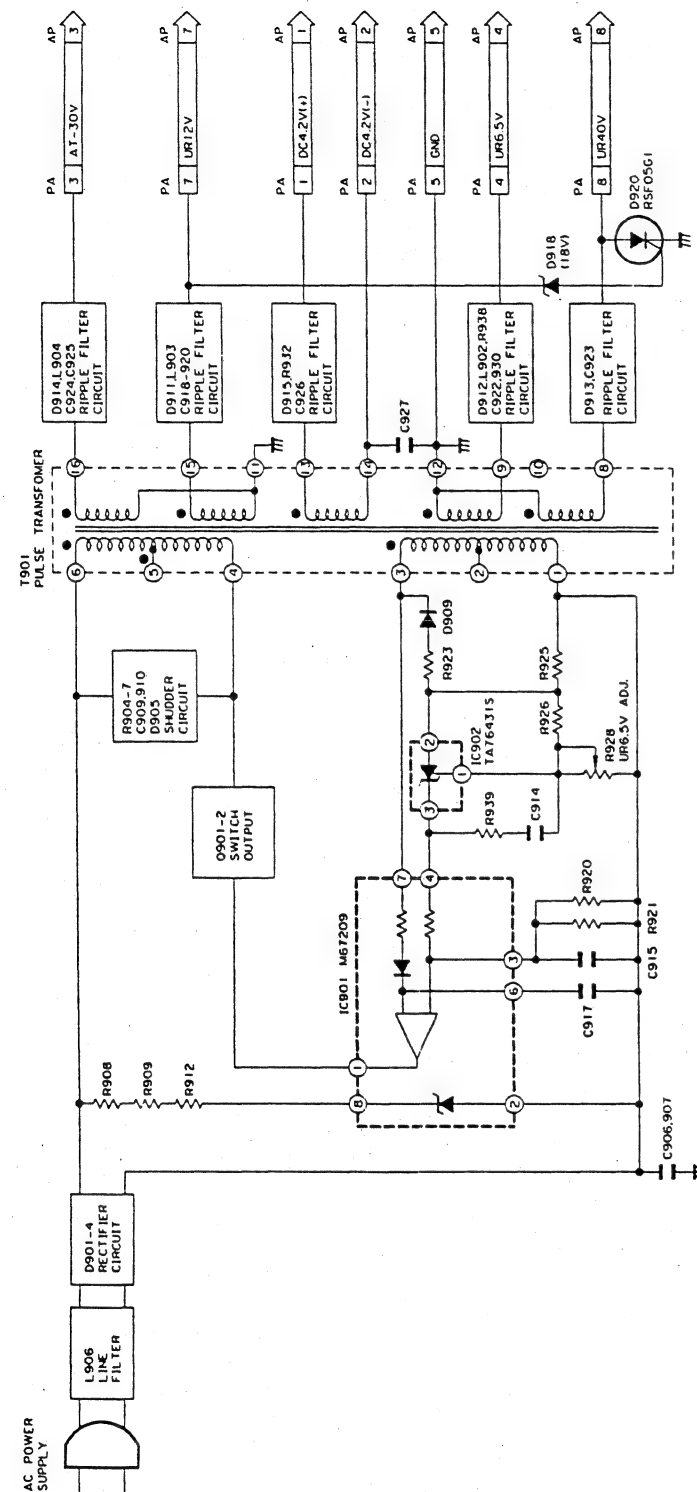
SAFETY DEVICE BLOCK DIAGRAM



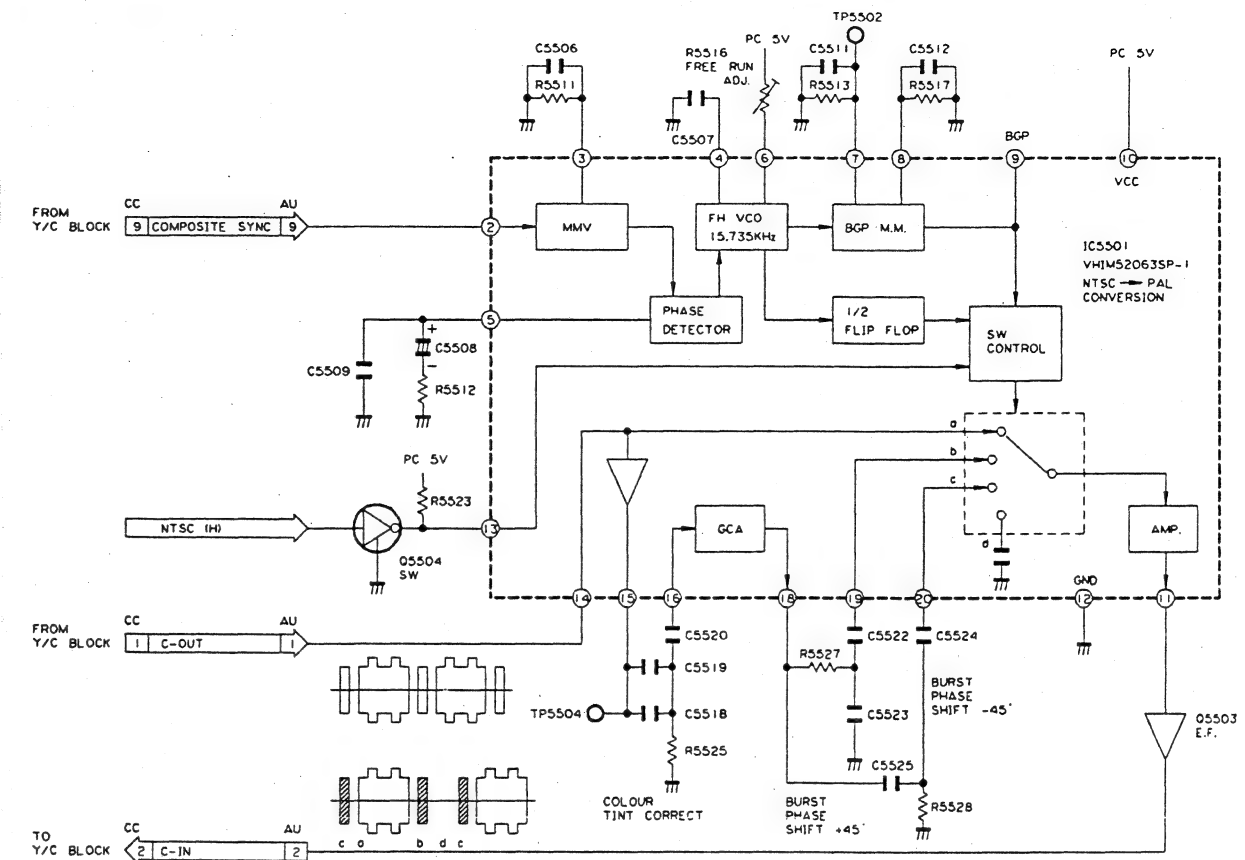
TIMER BLOCK DIAGRAM



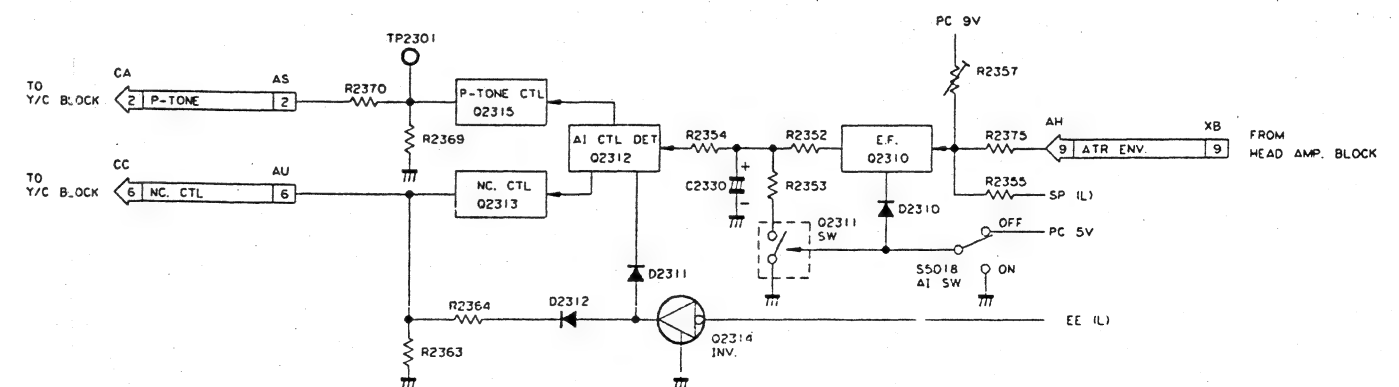
POWER CIRCUIT BLOCK DIAGRAM



NTSC → PAL SIMPLE CONVERSION BLOCK DIAGRAM



AUTO PICTURE CONTROL BLOCK DIAGRAM



SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE:
BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET. PARTS MARKED WITH "Δ" AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET. BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

SAFETY NOTES:

1. DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.
2. SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CASSIS IS OPERATING.

NOTES:

1. The unit of resistance "ohm" is omitted ($k = 1000 \text{ ohm}$, $M = 1 \text{ Meg ohm}$).
2. All resistors are 1/8 watt, unless otherwise noted.
3. The unit of capacitance "F" is omitted ($\mu = \mu F$, $p = pF$).
4. The values in parentheses are the ones in the PB mode; the values without parentheses are the ones in the REC mode.

VOLTAGE MEASUREMENT CONDITIONS:

1. DC voltages are measured between points indicated and chassis ground by VTVM, with AC 220V, 50/60Hz supplied to unit and all controls are set to normal viewing picture unless otherwise noted.
2. Voltages are measured with $10000\mu V$ B & W or colour signal.

WAVEFORM MEASUREMENT CONDITIONS:

$10000\mu V$ 87.5 percent modulated colour bar signal is fed into tuner.

CAUTION:

This circuit diagram is original one. Therefore there may be a slight difference from yours.

SIGNAL FLOW SYMBOLS AT A GLANCE

MAIN CIRCUIT (1)

D-ERR → Drum Error Voltage	C-ERR → Capstan Error Voltage
D-FG → Drum Frequency Comparison Signal	C-FG → Capstan Frequency Comparison Signal
D-PG → Drum Phase Comparison Signal	PBCTL → Playback Control Comparison Signal

MAIN CIRCUIT (2)

PB-C → Playback Chrominance Signal	REC-C → Recording Chrominance Signal
PB-Y → Playback Luminance Signal	REC-Y → Recording Luminance Signal
PB → Audio Playback Signal	REC → Audio Recording Signal
E-E → E-E Signal (Video) (Audio)	PB-C → NTSC → PAL Conversion

MAIN CIRCUIT (3)

PB → Audio Playback Signal	REC → Audio Recording Signal
E-E → Audio E-E Signal	

IF/TUNER CIRCUIT

PB-C → Playback Chrominance Signal	REC-C → Recording Chrominance Signal
PB-Y → Playback Luminance Signal	REC-Y → Recording Luminance Signal
PB → Audio Playback Signal	REC → Audio Recording Signal
E-E → E-E Signal (Video) (Audio)	

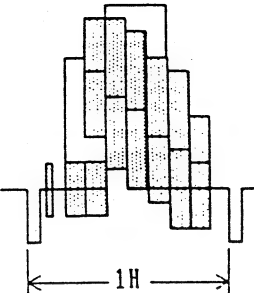
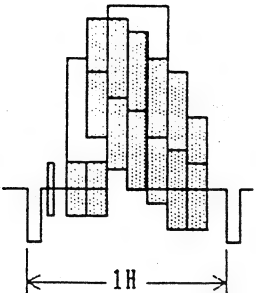
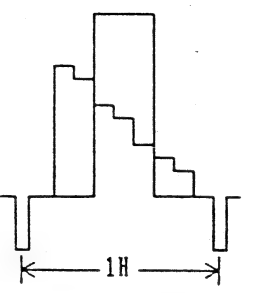
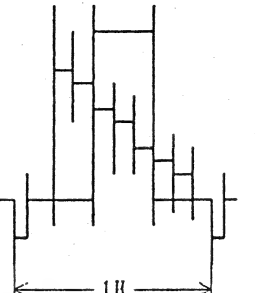
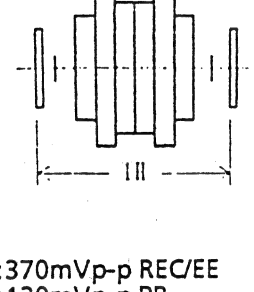
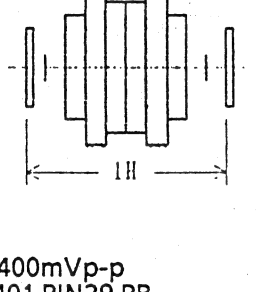
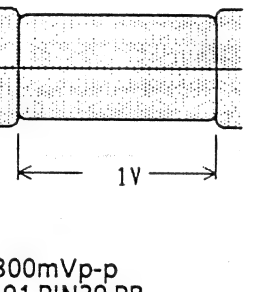
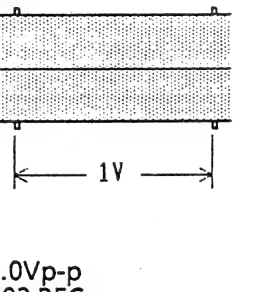
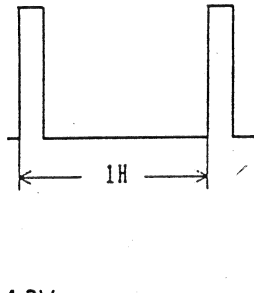
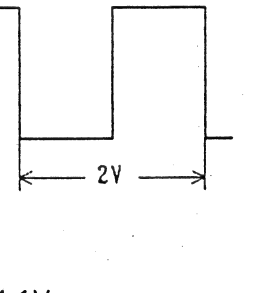
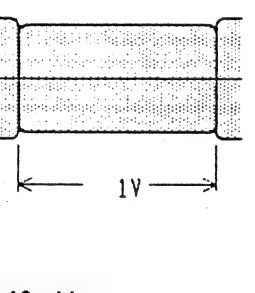
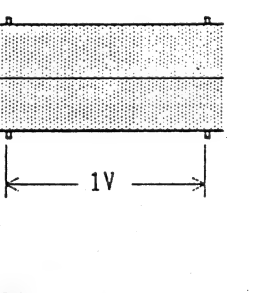
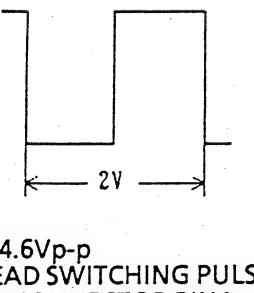
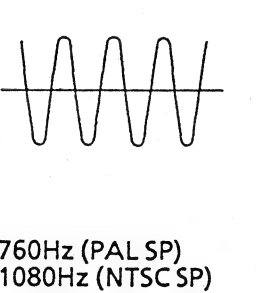
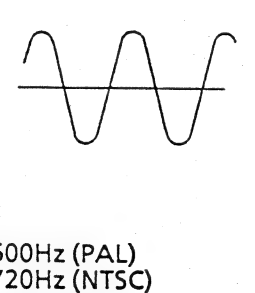
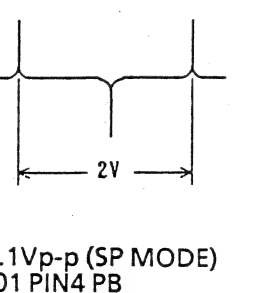
Y/C CIRCUIT

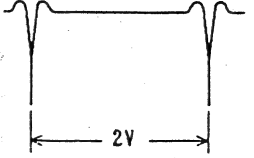
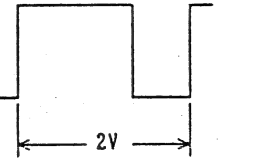
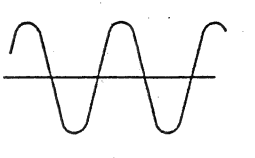
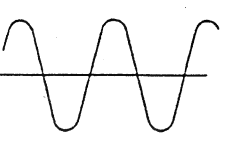
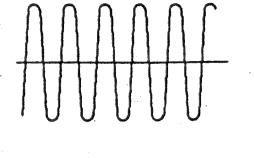
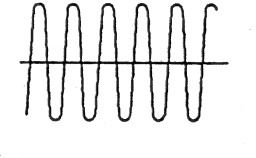
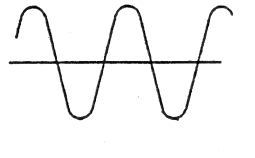
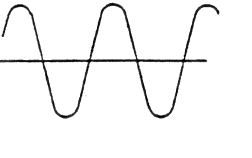
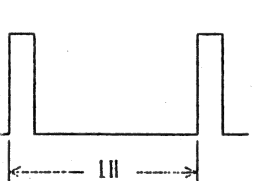
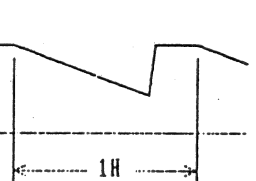
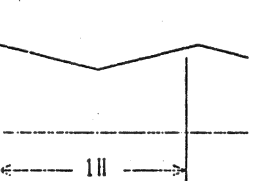
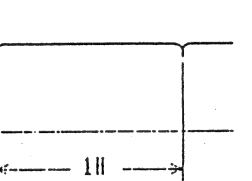
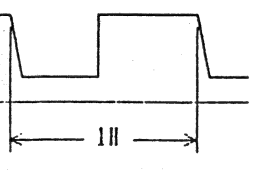
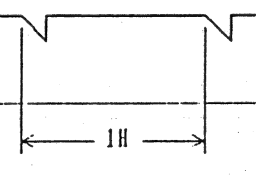
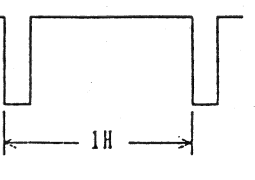
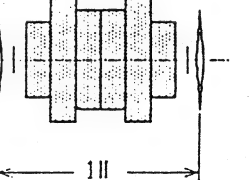
PB-C → Playback Chrominance Signal	REC-C → Recording Chrominance Signal
PB-Y → Playback Luminance Signal	REC-Y → Recording Luminance Signal
E-E → E-E Signal (Video) (Audio)	

HEAD AMP CIRCUIT

PB-C → Playback Chrominance Signal	REC-C → Recording Chrominance Signal
PB-Y → Playback Luminance Signal	REC-Y → Recording Luminance Signal

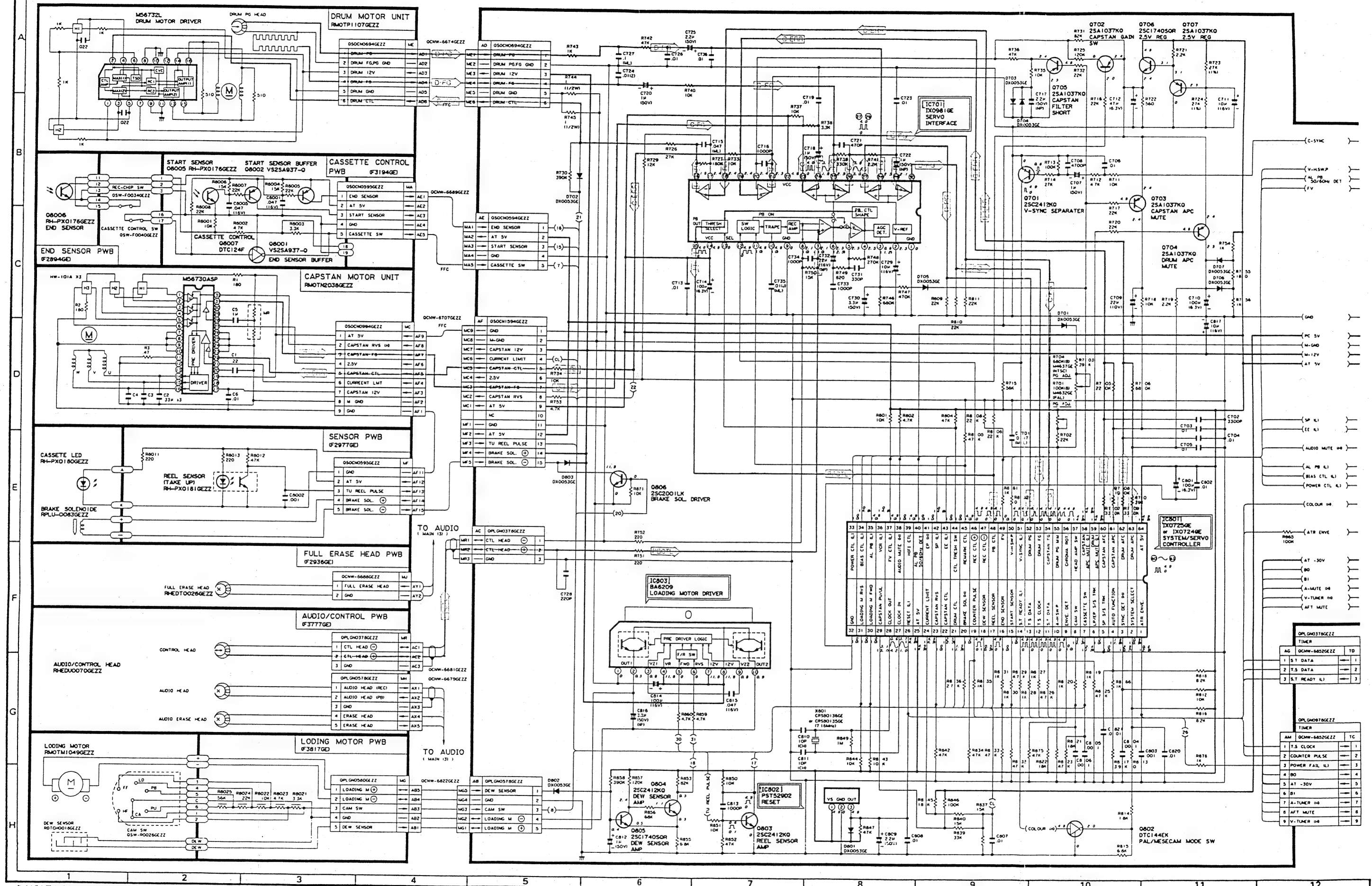
WAVEFORMS

 <p>V:1.0Vp-p IC401 PIN37 REC/EE</p>	 <p>V:2.0Vp-p IC401 PIN34 REC/PB</p>	 <p>V:540mVp-p REC/EE V:550mVp-p PB IC401 PIN4</p>	 <p>V:500mVp-p TP201 REC/EE</p>
 <p>V:370mVp-p REC/EE V:130mVp-p PB IC401 PIN15</p>	 <p>V:400mVp-p IC401 PIN29 PB</p>	 <p>V:300mVp-p IC401 PIN39 PB</p>	 <p>V:1.0Vp-p TP203 REC</p>
 <p>V:4.3Vp-p IC401 PIN32 COMPOSITE SYNC.</p>	 <p>V:1.1Vp-p IC401 PIN41 CHROMA ROTATION</p>	 <p>V:240mVp-p XB CONNECTOR PIN6 PB AH CONNECTOR PIN6</p>	 <p>V:130mVp-p XB CONNECTOR PIN2 REC AH CONNECTOR PIN2</p>
 <p>V:4.6Vp-p HEAD SWITCHING PULSE AH CONNECTOR PIN4 XB CONNECTOR PIN4</p>	 <p>H:760Hz (PAL SP) H:1080Hz (NTSC SP) V:1.5mVp-p AF CONNECTOR PIN6 PB/REC</p>	 <p>H:600Hz (PAL) H:720Hz (NTSC) V:40mVp-p AD CONNECTOR PIN4 PB/REC</p>	 <p>V:1.1Vp-p (SP MODE) IC701 PIN4 PB</p>

 <p>H:25Hz (PAL) H:30Hz (NTSC) V:400mVp-p AD CONNECTOR PIN1 PB</p>	 <p>H:25Hz (PAL) H:30Hz (NTSC) V:4.2Vp-p IC701 PIN15 PB</p>	 <p>H:1kHz V:38mVp-p IC601 PIN11 REC/EE</p>	 <p>H:1kHz V:1.8Vp-p IC601 PIN24 REC</p>
 <p>H:70kHz \pm 5kHz V:8mVp-p TP601 (+), TP602 (-) REC</p>	 <p>H:70kHz \pm 5kHz V:66Vp-p T601 PIN5 REC</p>	 <p>H:1kHz V:32mVp-p IC601 PIN9 PB</p>	 <p>H:1kHz V:0.96Vp-p REC V:0.8Vp-p PB AJ CONNECTOR PIN10</p>
 <p>V:4.2Vp-p IC5501 PIN2</p>	 <p>V:1.4Vp-p IC5501 PIN3</p>	 <p>V:0.7Vp-p IC5501 PIN4</p>	 <p>V:3.5V D.C. IC5501 PIN5</p>
 <p>V:1.7Vp-p IC5501 PIN7</p>	 <p>V:1.0Vp-p IC5501 PIN8</p>	 <p>V:4.1Vp-p IC5501 PIN9</p>	 <p>V:0.8Vp-p IC5501 PIN11</p>

• AUDIO REC: -8dBs 1KHz INPUT SIGNAL PB: Alignment tape (VROCPSV, 1KHz Level control signal)

MAIN (1) CIRCUIT

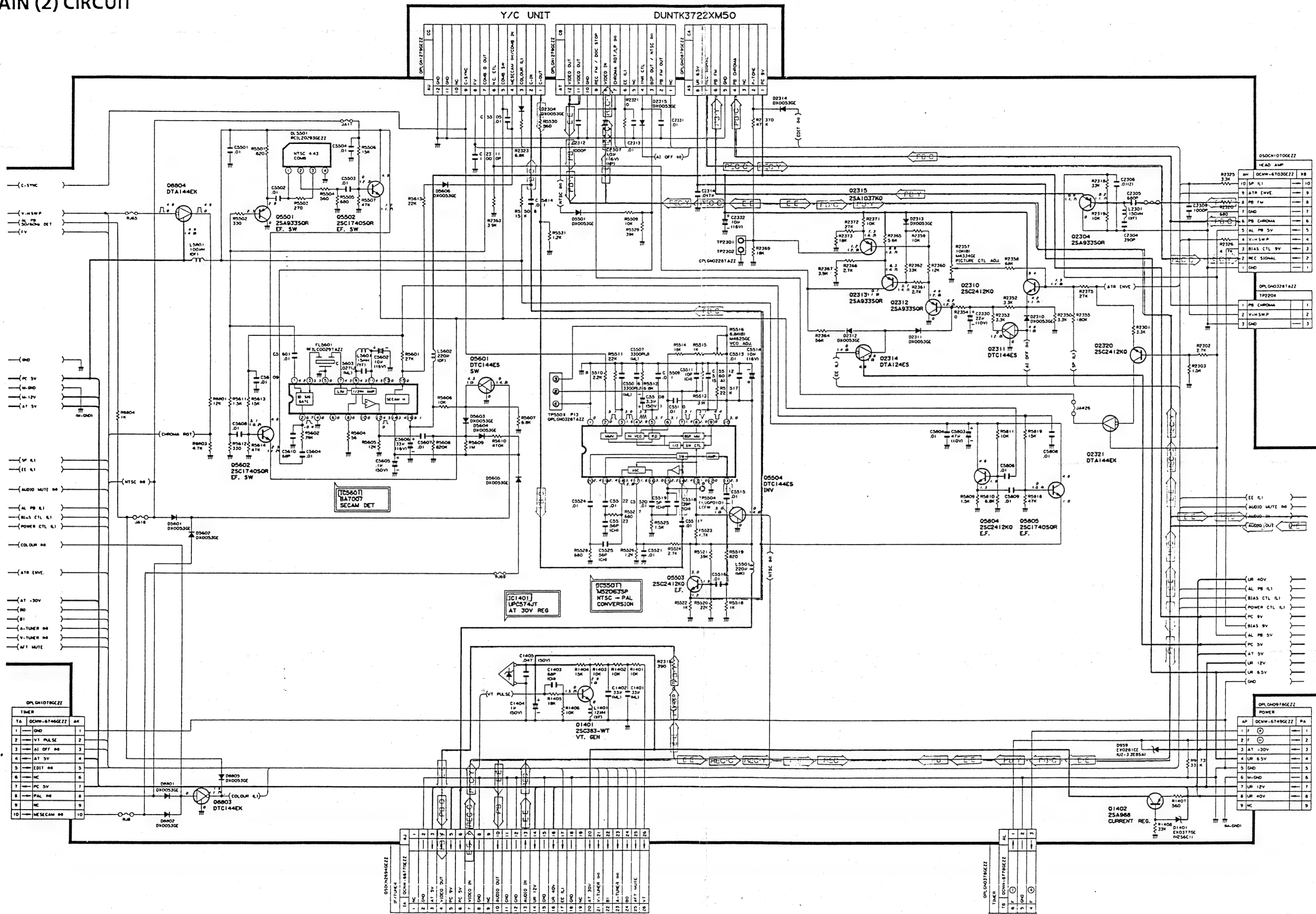


* VOLTAGE MEASUREMENT MODE

PB Parentheses ()

REC Without Parentheses

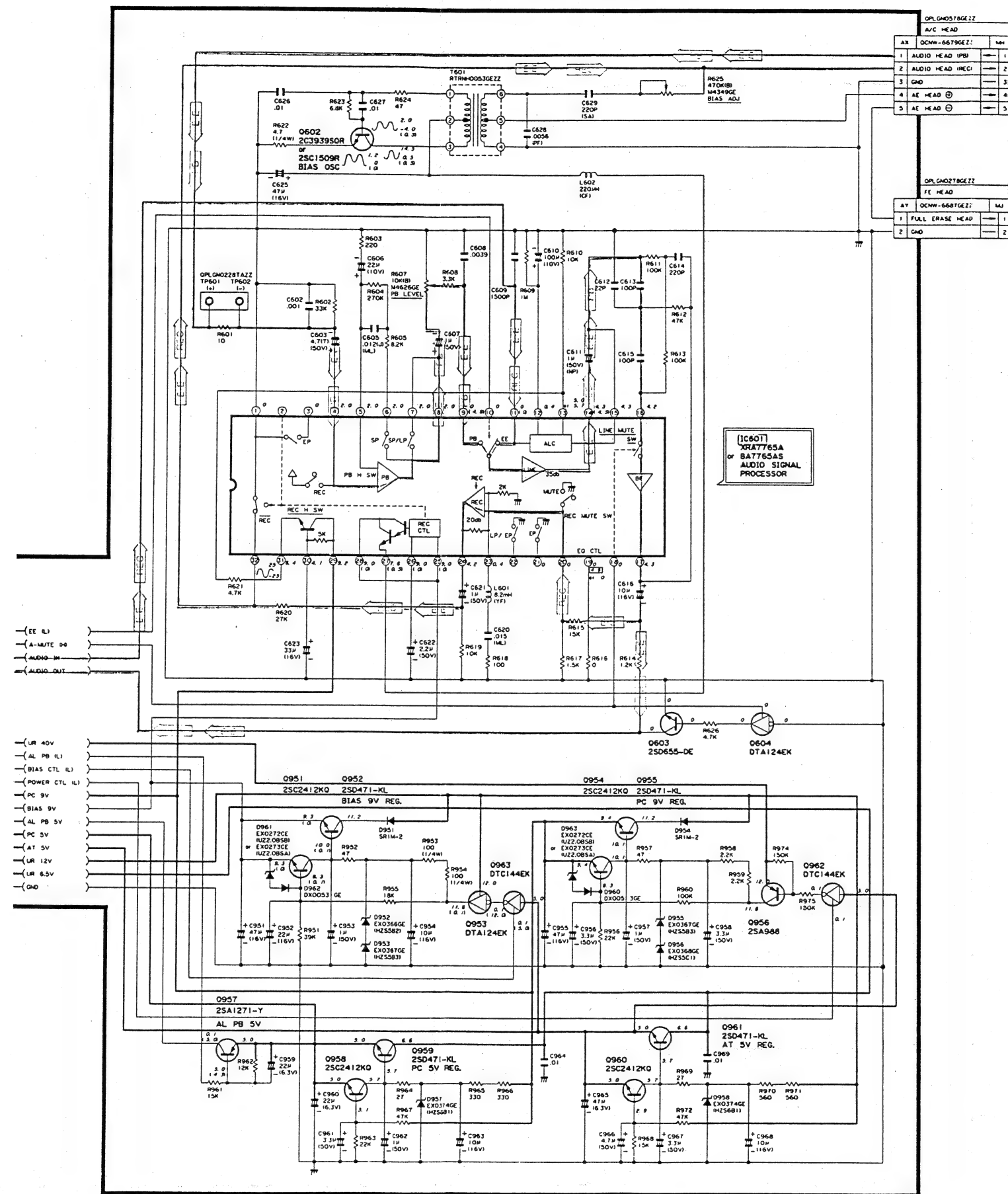
MAIN (2) CIRCUIT



* VOLTAGE MEASUREMENT MODE

PB Parentheses ()
REC Without Parentheses

MAIN (3) CIRCUIT



OPL GND57AGE12		
A/C HEAD		
1	OCNN-6679GEZ1	MA
2	AUDIO HEAD (HPC1)	1
3	AUDIO HEAD (HPC1)	2
4	AE HEAD (HPC1)	3
5	AE HEAD (HPC1)	4
6	AE HEAD (HPC1)	5

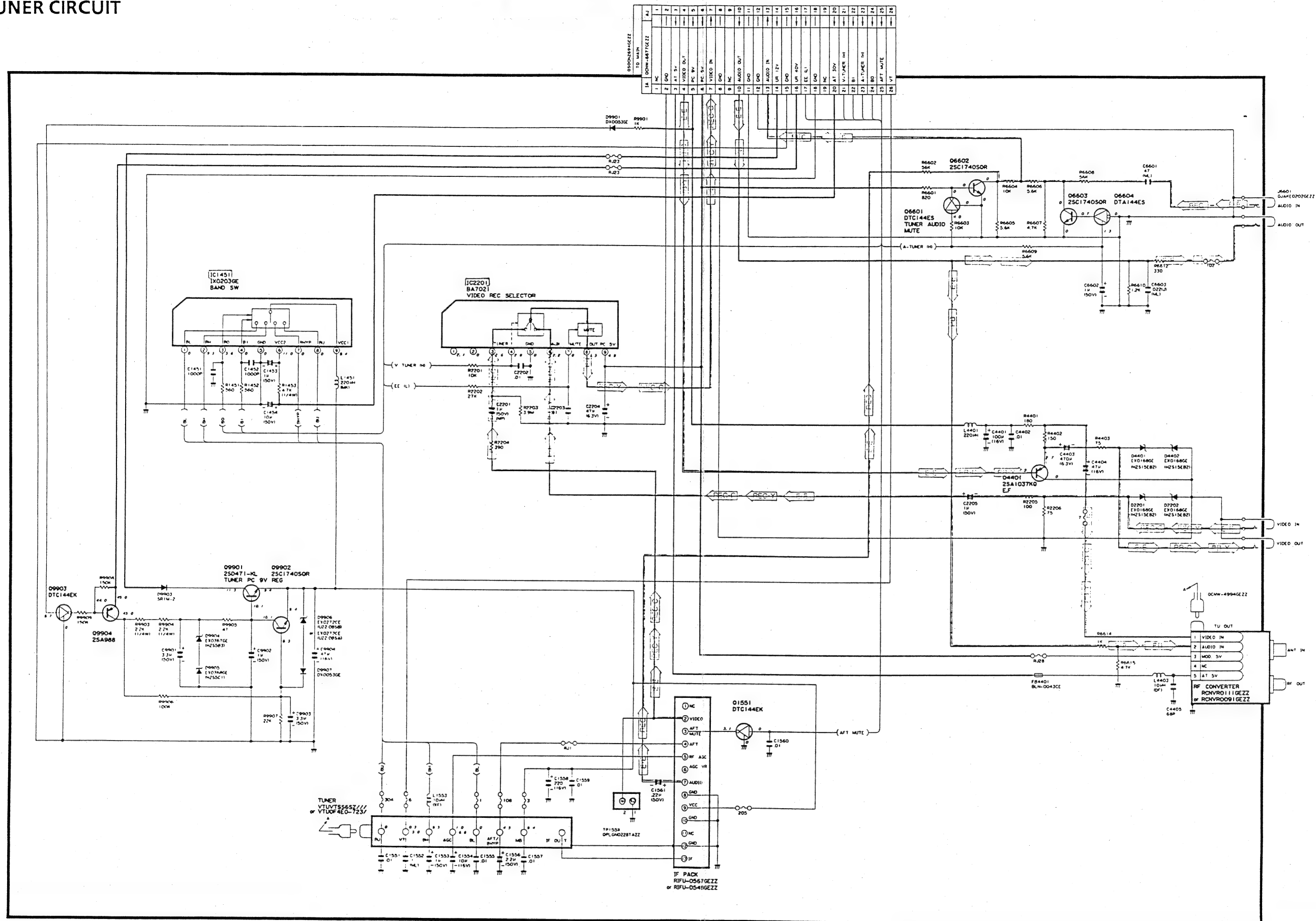
OPL GND27AGE12		
FE HEAD		
1	OCNN-6687GEZ1	MA
2	FULL ERASE HEAD	1
3	GND	2

* VOLTAGE MEASUREMENT MODE

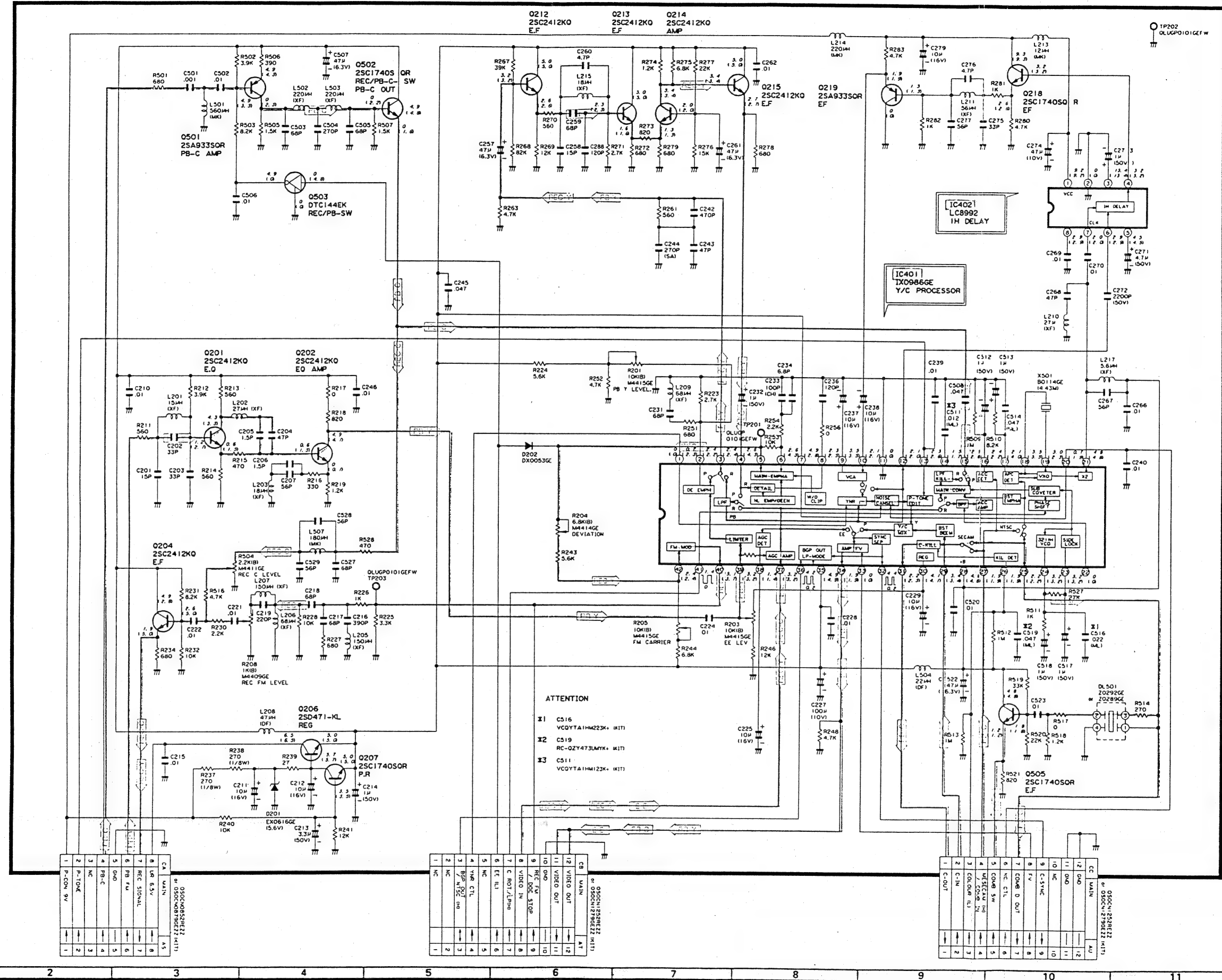
PB Parentheses ()

REC Without Parentheses

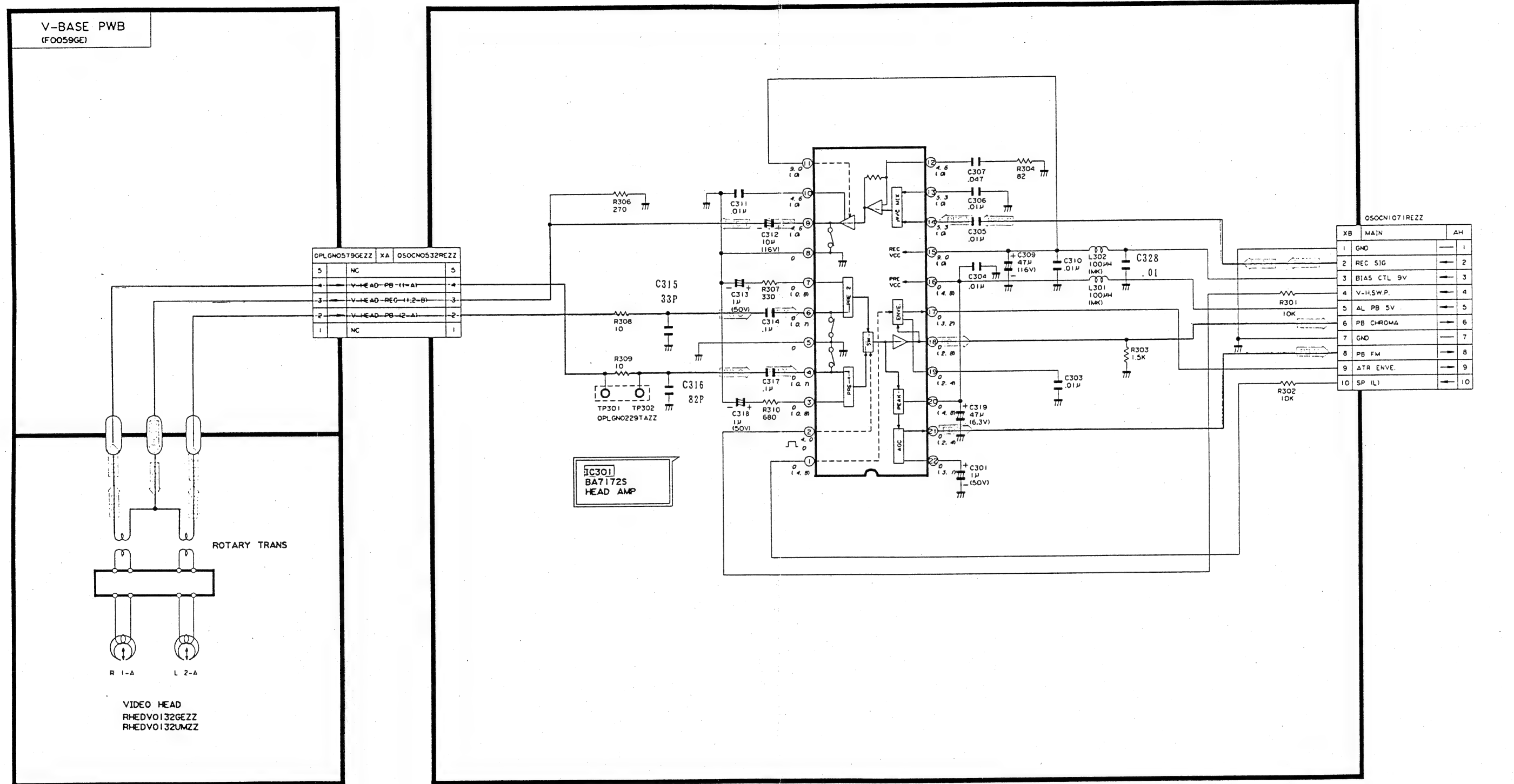
IF/TUNER CIRCUIT



Y/C CIRCUIT



HEAD AMPLIFIER CIRCUIT



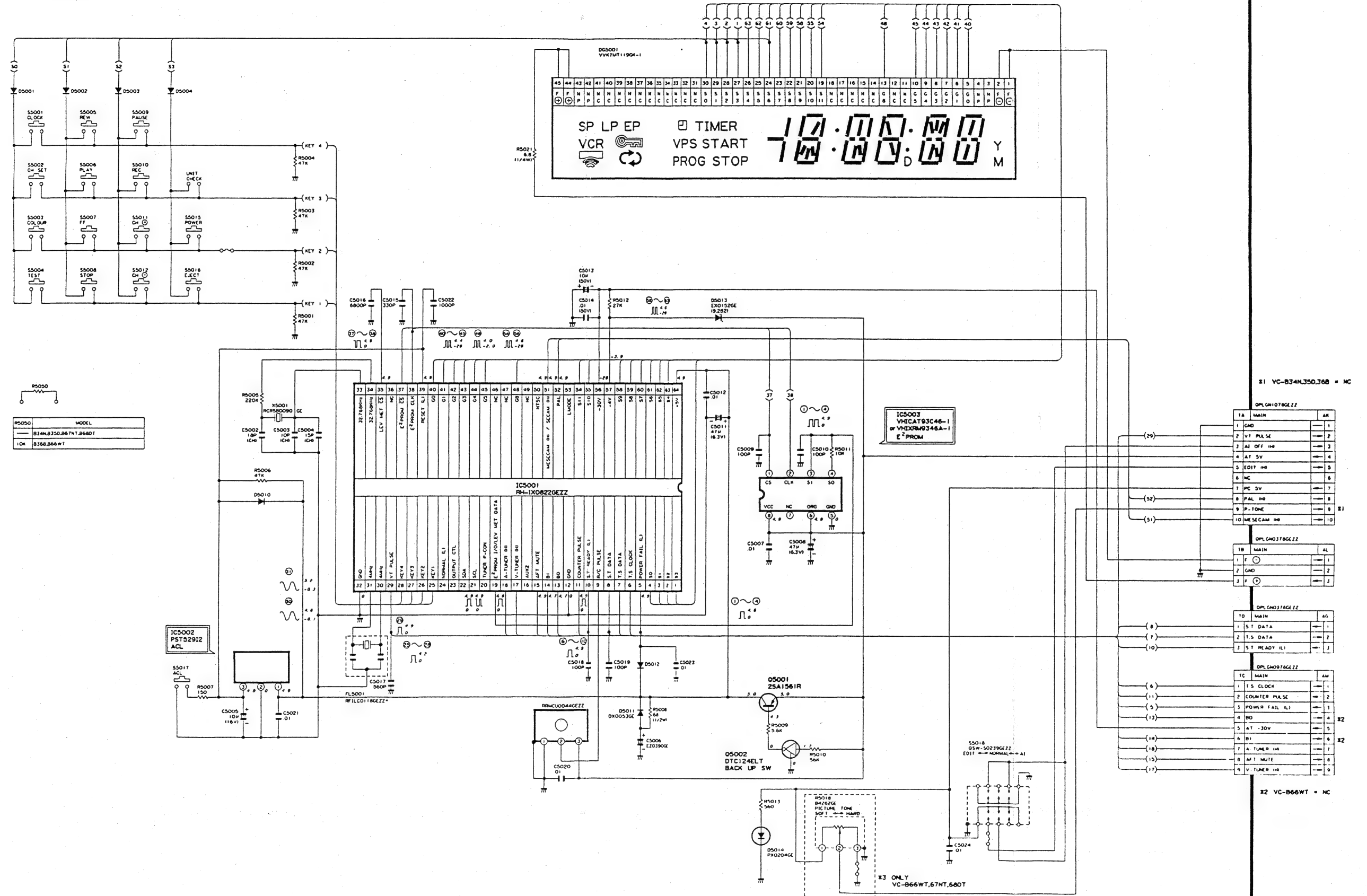
* VOLTAGE MEASUREMENT MODE

PB Parentheses ()

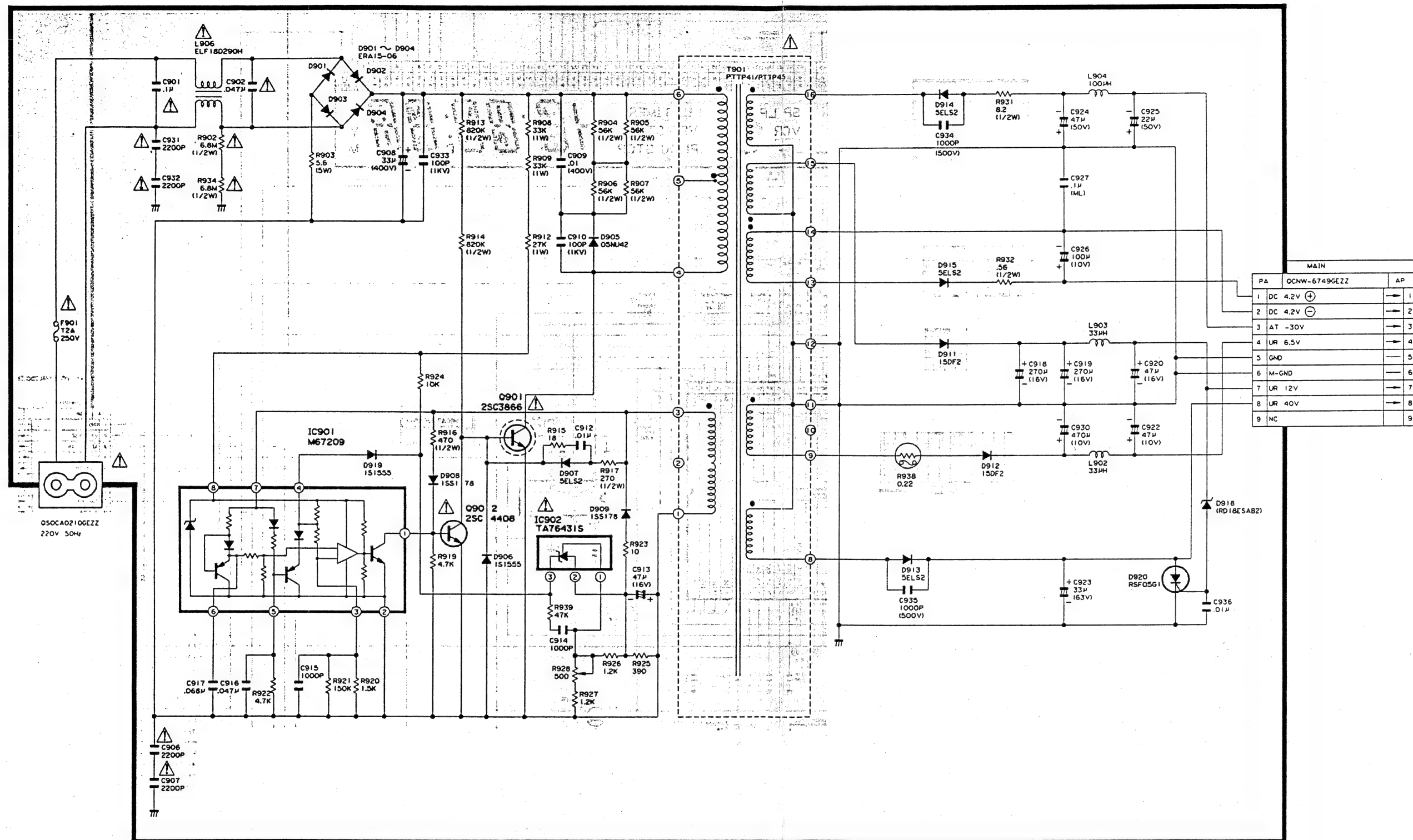
REC Without Parentheses

TIMER CIRCUIT

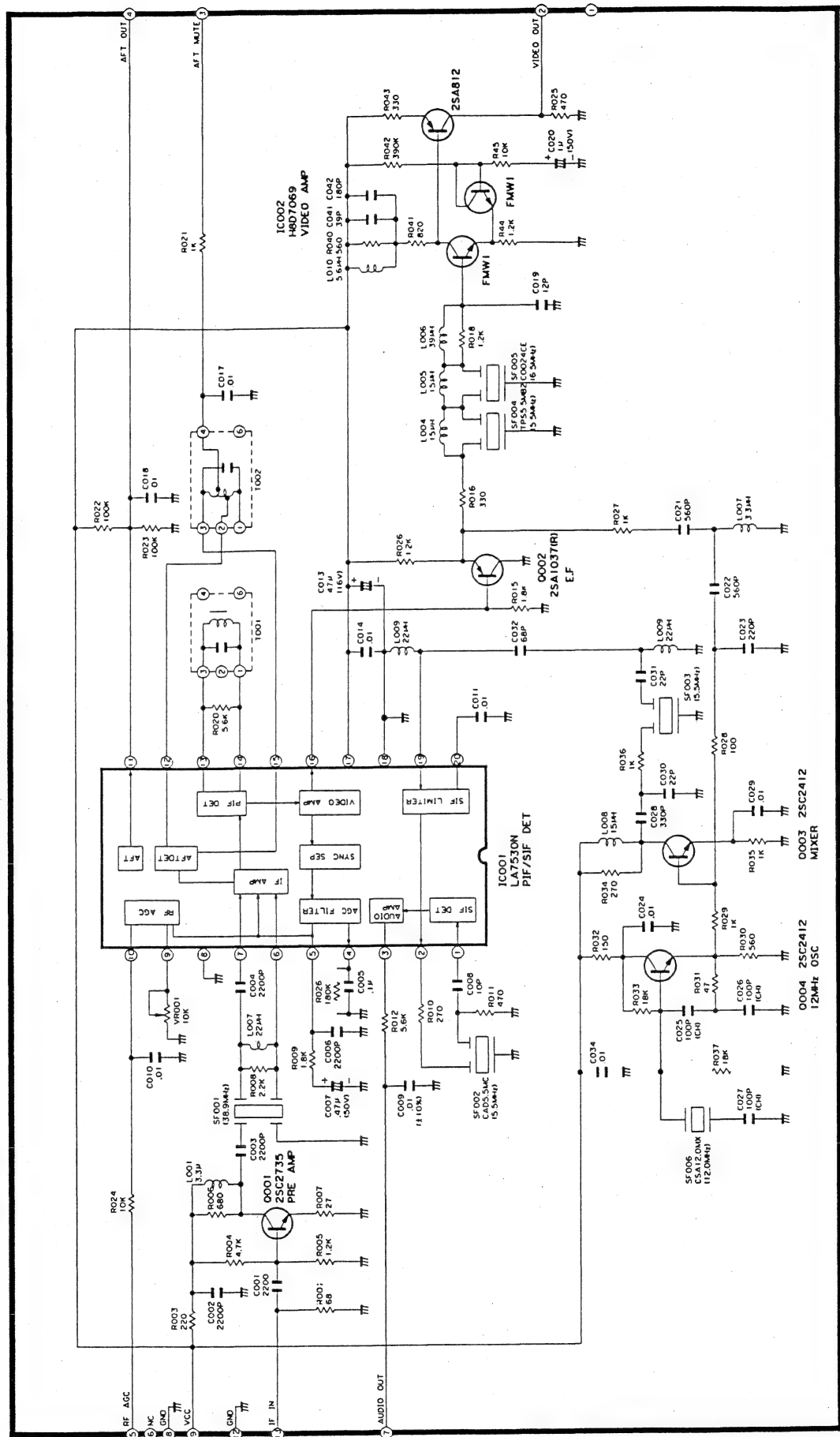
D100E RH-DX0053GE2Z
KEY SW OSW-K0079GE2Z



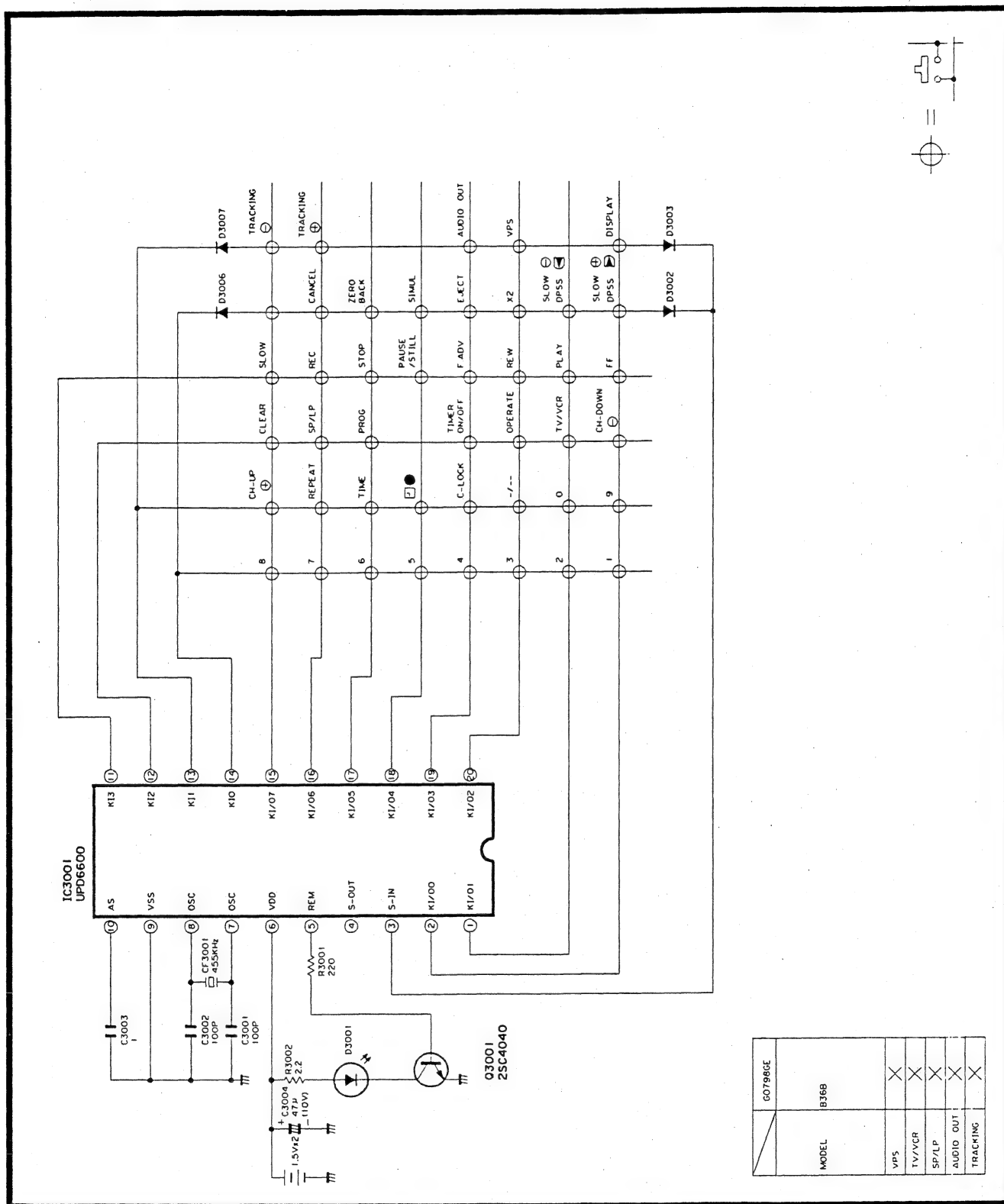
POWER CIRCUIT



IF PACK



INFRARED REMOTE CONTROL CIRCUIT



1	2	3	4	5	6	7	8	9	10	11	12
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REPLACEMENT PARTS LIST

PARTS REPLACEMENT

Many electrical and mechanical parts in video cassette recorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by Δ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

- | | |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO. |
| 3. PART NO. | 4. DESCRIPTION |
| 5. PRICE CODE | |

Δ MARK: SAFETY RELATED PARTS

PWB ASSEMBLY IS NOT REPLACEMENT ITEM

Ref. No.	Part No.	Description	Code
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MAIN (SERVO, SYSTEM-CONTROL, AUDIO) CIRCUIT

DUNTK3724XM53 Main Board Assembly —

TRANSISTORS

Q602	VS2C3939SQR-1	2SC3939SQR	AC
	or		
	VS2SC1509R/-1	2SC1509R	AD
Q603	VS2SD655-DE1E	2SD655-DE	AC
Q604,	VSDTA124EK/-1	DTA124EK	AB
953			
Q701,	VS2SC2412KQ-1	2SC2412KQ	AA
803,			
804,			
951,			
954,			
958,			
960,			
2310,			
2320,			
5503,			
5804			

Ref. No.	Part No.	Description	Code
Q702	VS2SA1037KQ-1	2SA1037KQ	AA
I			
705,			
707,			
2315			
Q706,	VS2C1740SQR1E	2SC1740SQR	AC
805,			
5502,			
5602,			
5805			
Q802,	VSDTC144EK/-1	DTC144EK	AB
962,			
963,			
8803			
Q806	VS2SC2001LK-1	2SC2001LK	AA
Q952,	VS2SD471-KL1E	2SD471-KL	AC
955,			
959,			
961			
Q956,	VS2SA988///1E	2SA988	AB
1402			
Q957	VS2SA1271-Y-1	2SA1271-Y	AB
Q1401	VS2SC383-WT-1	2SC383-WT	AE
Q2304,	VS2SA933SQR1E	2SA933SQR	AB
2312,			
2313,			
5501			
Q2311,	VSDTC144ES/-1	DTC144ES	AB
5504,			
5601			
Q2314	VSDTA124ES/-1	DTA124ES	AB
Q2321,	VSDTA144EK/-1	DTA144EK	AC
8804			

INTEGRATED CIRCUITS

IC601	VHiBA7765AS-1	AL
	or	
	VHiXRA7765A-1	AH
IC701	RH-IX0981GEZZ	AH
IC801	RH-IX0723GEZZ	AX
IC802	VHiPST529D2-1	AD
IC803	VHiBA6209//1	AK
IC1401	VHiUPC574JT-1	AC
IC5501	VHiM52063SP-1	AP
IC5601	VHiBA7007//1	AM

Ref. No.	Part No.	Description	Code
DIODES AND CRYSTAL			
D701	RH-DX0053GEZZ	1SS132	AA
707,			
801,			
802,			
803,			
960,			
962,			
2304,			
2310			
2315,			
5501,			
5601			
5606,			
8801,			
8802,			
8805			
D951,	VHDSR1M-2// -1	SR1M-2	AA
954			
D952	RH-EX0366GEZZ	HZS5B2	AA
D953,	RH-EX0367GEZZ	HZS5B3	AA
955			
D956	RH-EX0368GEZZ	HZS5C1	AA
D957,	RH-EX0374GEZZ	HZS6B1	AA
958			
D959	RH-EX0281CEZZ	UZ3.3EBSA	AA
D961,	RH-EX0272CEZZ	UZ2.0BSB	AA
963	or		
	RH-EX0273CEZZ	UZ2.0BSA	AA
D1401	RH-EX0377GEZZ	HZS6C1	AA
X801	RCRSB0136GEZZ	Crystal, 7.16MHz	AF

CONTROLS			
R607	RVR-M4626GEZZ	10k(B), PB Level Adj.	AB
R625	RVR-M4636GEZZ	470k(B), Bias Adj.	AB
R701	RVR-M4632GEZZ	100k(B), PG Adj. (PAL)	AB
R704	RVR-M4637GEZZ	680k(B), PG Adj. (NTSC)	AB
R2357	RVR-M4334GEZZ	10k(B), Picture Control	AB
R5516	RVR-M4625GEZZ	6.8k(B), VCO Adj.	AB

COILS AND TRANSFORMER			
DL5501	RCILZ0293GEZZ	Delay Line	AP
FL5601	RFILC0029TAZZ	Filter	AD
L601	VP-YF822J0000	8.2mH	AC
L602	VP-CF221K0000	220μH	AB
L1401	VP-XF120K0000	12μH	AB
L2301	VP-XF151K0000	150μH	AB

Ref. No.	Part No.	Description	Code
L5501	VP-MK221K0000	220μH	AB
L5601	VP-YF153J0000	15mH	AC
L5602	VP-DF221K0000	220μH	AB
L5801	VP-DF101K0000	100μH	AB
T601	RTRNH0053GEZZ	Osc. Transformer	AE

CAPACITORS			
C605	RC-QZA123TAYJ	0.012μF, 50V, ±5%, Mylar	AB
C610	VCEAEA1AW107M	100μF, 10V, 20%, Electrolytic	AB
C611,	VCE9EA1HW105M	1μF, 50V, 20%, Electrolytic (N.P.)	AC
722			
C620	VCQYWA1HW153J	0.015μF, 50V, 5%, Mylar	AA
C628	VCQPSA2AA562J	5600pF, 100V, 5%, Plastic Film	AC
C701,	VCFYSA1HB473J	0.047μF, 50V, 5%, Mylar	AA
715			
C710,	VCEAEA0JW107M	100μF, 6.3V, 20%, Electrolytic	AB
714,			
801			
C717	VCE9EA1HW225M	2.2μF, 50V, 20%, Electrolytic (N.P.)	AB
C727	VCFYSA1HB104J	0.1μF, 50V, 5%, Mylar	AB
C732	VCE9EA1CW226M	22μF, 16V, 20%, Electrolytic (N.P.)	AC
C735	RC-QZA103TAYJ	0.01μF, 50V, 5%, Mylar	AB
C814	VCEAEA1CW107M	100μF, 16V, 20%, Electrolytic	AC
C815	RC-KZ0017GEZZ	0.047μF, 16V, Ceramic	AA
C816	VCE9EA1HW335M	3.3μF, 50V, 20%, Electrolytic (N.P.)	AB
C1401,	VCFYSA1HB334J	0.33μF, 50V, 5%, Mylar	AB
1402			
C2307	VCE9EA1CW106M	10μF, 16V, 20%, Electrolytic (N.P.)	AC
C5506,	RC-QZA332TAYJ	3300pF, 50V, 5%, Mylar	AB
5507			
C5603	RC-QZA273TAYJ	0.027μF, 50V, 5%, Mylar	AB

MISCELLANEOUS			
QPLGN0228TAZZ	Plug, 2 pin (TP601-602, TP2301-2302)		AB
QPLGN0278GEZZ	Plug, 2 pin (AY)		AA
QPLGN0328TAZZ	Plug, 3 pin (TP2201-2203, TP5501-5503)		AD
QPLGN0378GEZZ	Plug, 3 pin (AC, AG, AL)		AB
QPLGN0578GEZZ	Plug, 5 pin (AB, AX)		AB
QPLGN0879GEZZ	Plug, 8 pin (AS)		AB
QPLGN0978GEZZ	Plug, 9 pin (AM, AP)		AC
QPLGN1078GEZZ	Plug, 10 pin (AK)		AC

Ref. No.	Part No.	Description	Code
	QPLGN1279GEZZ	Plug, 12 pin (AT, AU)	AC
	QSOCN0594GEZZ	Socket, 5 pin (AE)	AB
	QSOCN0694GEZZ	Socket, 6 pin (AD)	AB
	QSOCN1070REZZ	Socket, 10 pin (AH)	AB
	QSOCN1594GEZZ	Socket, 15 pin (AF)	AD
	QSOCN2694GEZZ	Socket, 26 pin (AJ)	AD

Y/C CIRCUIT			
DUNTK3722XM50	Y/C Board Assembly		—

TRANSISTORS			
Q201, 202, 204, 212 215	VS2SC2412KQ-1	2SC2412KQ	AA
Q206	VS2SD471-KL1E	2SD471-KL	AC
Q207, 218, 502, 505	VS2C1740SQR1E	2SC1740SQR	AC
Q219, 501	VS2SA933SQR1E	2SA933SQR	AB
Q503	VSDTC144EK/-1	DTC144EK	AB

INTEGRATED CIRCUITS			
IC401	RH-IX0986GEZZ		AV
IC402	VHILC8992// -1		AK

DIODES AND CRYSTAL			
D201	RH-EX0616GEZZ	Zener Diode	AA
D202	RH-DX0053GEZZ	1SS132	AA
X501	RCRSB0114GEZZ	Crystal, 4.43MHz	AG

CONTROLS			
R201, 203, 205	RVR-M4415GEZZ	10k(B), PB Y Level Adj. 10k(B), EE Level Adj. 10k(B), FM Carrier Adj.	AB
R204	RVR-M4414GEZZ	6.8k(B), Deviation Adj.	AB
R208	RVR-M4409GEZZ	1k(B), REC FM Level Adj.	AB
R504	RVR-M4411GEZZ	2.2k(B), REC C Level Adj.	AB

Ref. No.	Part No.	Description	Code
COILS AND DELAY LINE			
DL501	RCILZ0292GEZZ	Delay Line	AP
	or		
	RCILZ0289GEZZ		AP
L201	VP-XF150K0000	15μH	AB
L202, 210	VP-XF270K0000	27μH	AB
L203, 215	VP-XF180K0000	18μH	AB
L205, 207	VP-XF151K0000	150μH	AB
L206, 209	VP-XF680K0000	68μH	AB
L208	VP-DF470K0000	47μH	AB
L211	VP-XF560K0000	56μH	AB
L213	VP-MK120K0000	12μH	AB
L214	VP-MK221K0000	220μH	AB
L217	VP-XF5R6K0000	5.6μH	AB
L501	VP-MK561K0000	560μH	AB
L502, 503	VP-XF221K0000	220μH	AB
L504	VP-DF220K0000	22μH	AB
L507	VP-MK181K0000	180μH	AB

CAPACITORS			
C227	VCEAEA1AW107M	100μF, 10V, 20%, Electrolytic	AB
C245, 508	RC-KZ0017GEZZ	0.047μF, 16V, Ceramic	AA
C511	RC-QZA123TAYJ	0.013μF, 50V, 5%, Mylar	AB
C514, 519	VCFYSA1HB473J	0.047μF, 50V, 5%, Mylar	AA
C516	RC-QZA223TAYJ	0.022μF, 50V, 5%, Mylar	AB

MISCELLANEOUS			
	QSOCN0852REZZ	Socket, 8 pin (CA)	AB
	QSOCN1252REZZ	Socket, 12 pin (CB, CC)	AC

HEAD AMP. CIRCUIT			
DUNTK3720XM50	HEAD AMP. Board Assembly		—

Ref. No.	Part No.	Description	Code
INTEGRATED CIRCUIT			
IC301	VHiBA7172S/-1		AH

COILS			
L301, 302	VP-MK101K0000	100μH	AB

CAPACITORS			
C307	VCFYSA1HB473J	0.047μF, 50V, 5%, Mylar	AA
C314, 317	RC-KZ0029GEZZ	0.1μF, Ceramic	AA

MISCELLANEOUS			
	QPLGN0229TAZZ	Plug, 2 pin (TP301-302)	AB
	QSOCN0532REZZ	Socket, 5 pin (XA)	AB
	QSOCN1071REZZ	Socket, 10 pin (XB)	AB

TIMER CIRCUIT			
	DUNTK3738HE53	Timer Board Assembly	—

TRANSISTORS			
Q5001	VS2SA1561R/1E	2SA1561R	AB
Q5002	VSDTC124ELT-1	DTC124ELT	AA

INTEGRATED CIRCUITS			
IC5001	RH-IX0822GEZZ		AW
IC5002	VHiPST529i2-1		AD
IC5003	VHiCAT93C46-1		AN
	or		
	VHiXRM9346A-1		AK

DIODES AND CRYSTAL			
D5001	RH-DX0053GEZZ	1SS132	AA
	or		
5004, 5010, 5011, 5012	RH-DX0048GEZZ	1N4531	AA
D5013	RH-EX0152GEZZ	9.2B2	AA

Ref. No.	Part No.	Description	Code
D5014	RH-PX0204GEZZ	Photodiode	AB
X5001	RCRSB0090GEZZ	Crystal	AE

FILTER			
FL5001	RFILC0118GEZZ		AC

CAPACITOR			
C5006	RC-EZ0390GEZZ		AF

MISCELLANEOUS			
DG5001	VVK7MT119GK-1	Fluorescent Display Tube	AU
	QPLGN0378GEZZ	Plug, 3 pin (TB, TD)	AB
	QPLGN0978GEZZ	Plug, 9 pin (TC)	AC
	QPLGN1078GEZZ	Plug, 10 pin (TA)	AC
	RRMCU0044GEZZ	Remote Receiver	AL
S5001,	QSW-K0079GEZZ	Switch, Clock	AB
5002,		Switch, Channel Set	
5003,		Switch, Color	
5004,		Switch, Test	
5005,		Switch, Rewind	
5006,		Switch, Playback	
5007,		Switch, Fast Forward	
5008,		Switch, Stop	
5009,		Switch, Pause	
5010,		Switch, Recording	
5011,		Switch, Channel Up	
5012,		Switch, Channel Down	
5015,		Switch, Power	
5016,		Switch, Eject	
5017		Switch, ACL	
S5018	QSW-S0239GEZZ	Switch, Edit/Auto Picture	AD

IF/TUNER CIRCUIT			
	DUNTK3728XM61	IF/Tuner Board Assembly	—

TRANSISTORS			
Q1551,	VSDTC144EK/-1	DTC144EK	AB
9903			
Q4401	VS2SA1037KQ-1	2SA1037KQ	AA
Q6601	VSDTC144ES/-1	DTC144ES	AB
Q6602,	VS2C1740SQR1E	2SC1740SQR	AC
6603,			
9902			

Ref. No.	Part No.	Description	Code
Q6604	VSDTA144ES/-1	DTA144ES	AB
Q9901	VS2SD471-KL1E	2SD471-KL	AC
Q9904	VS2SA988///1E	2SA988	AB

INTEGRATED CIRCUITS

IC1451	RH-IX0203GEZZ		AE
IC2201	VHIBA7021/-1		AE

DIODES

D2201, 2202, 4401, 4402	RH-EX0168GEZZ	HZS15EB2	AA
D9901, 9907	RH-DX0053GEZZ	1SS132	AA
D9903	VHDSR1M-2//1	SR1M-2	AA
D9904	RH-EX0367GEZZ	HZS5B3	AA
D9905	RH-EX0368GEZZ	HZS5C1	AA
D9906	RH-EX0272CEZZ	UZ2.0BSB	AA
	or		
	RH-EX0273CEZZ	UZ2.0BSA	AA

COILS

L1451, 4401	VP-MK221K0000	220μH	AB
L1553	VP-XF100K0000	10μH	AB
L4403	VP-DF100K0000	10μH	AB

CAPACITORS

C1552	VCFYSA1HB104J	0.1μF, 50V, 5%, Mylar	AB
C1558	VCEA2A1CW227M	220μF, 16V, 20%, Electrolytic	AB
C2201	VCE9EA1HW105M	1μF, 50V, 20%, Electrolytic (N.P.)	AC
C4401	VCEAEA1CW107M	100μF, 16V, 20%, Electrolytic	AC
C4403	VCEA2A0JW477M	470μF, 6.3V, 20%, Electrolytic	AB
C6603	RC-QZA223TAYJ	0.022μF, 50V, 5%, Mylar	AB

MISCELLANEOUS

	RIFU-0567GEZZ	IF-PACK	AX
	or		
	RIFU-0548GEZZ		BA

Ref. No.	Part No.	Description	Code
	RCNVR0091GEZZ		BA
	VTUVTSS6SZ///	VHF Tuner	BA
FB4401	RBLN-0043CEZZ	Ferrite Bead	AB
J6601	QJAKE0135GEZZ	Jack, Audio IN/OUT, Video IN/OUT	AC
	QPLGN0228TAZZ	Plug, 2 pin (TP1551-1552)	AB
	QSOCN2694GEZZ	Socket, 26 pin (IA)	AD

POWER CIRCUIT

	RDENC0485GEZZ	Power Board Assembly	—
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TRANSISTORS

△Q901	95KUAC0234AZ	2SC3866	AH
△Q902	95KUAC0214AK	2SC4408	AD

INTEGRATED CIRCUITS

△IC901	95KUCH0078ZZ		AM
△IC902	95KUCC0043AK		AE

DIODES

△D901	95KUBC0125DK	ERA15-06V1	AB
△904			
△D905	95KUBC0248AK	05NU42	AC
△D906,	95KUBC0249AK	1S1555	AA
△919			
△D907,	95KUBC0250AK	5ELS2	AC
913,			
△914,			
△915			
△D908,	95KUBA0033AK	1SS178	AA
△909			
△D911,	95KUBC0236AC	15DF2	AD
△912			
△D918	95KUBDAK180C	RD18ESAB2	AB
△D920	95KUDA0064AK	RSF05G1	AB

CONTROL

△R928	95KUFBA501CD	500 ohm, Adj.	AC
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Ref. No.	Part No.	Description	Code
COILS AND TRANSFORMER			
△L902, △ 903	95KUKZ0250ZZ	33μH, Choke Coil	AD
L904	95KUKZ0256ZZ	100μH, Inductance Coi	AC
△L906	95KUKZ0259ZZ	Filter	AK
△T901	95K129035023	Power Transformer, PTTP41/PTTP45	AW

CAPACITORS			
△C901	95KUGFZ104FE	0.1μF, Film	AE
△C902	95KUGFZ473FE	0.047μF, Film	AE
△C906, △ 907, △ 931, △ 932	95KUGCQ222AB	2200pF, Ceramic	AD
△C908	95KUGAQ330KN	33μF, 400V, Electrolytic	AH
△C909	95KUGFQ103FB	0.01μF, 400V, Film	AC
△C910, △ 933	95KUGCU101AJ	100pF, 1kV, Ceramic	AC
△C912	95KUGFF103BQ	0.01μF, Film	AB
△C913	95KUGAC470HN	47μF, 16V, Electrolytic	AB
△C914	95KUGFF102BQ	1000pF, Film	AB
△C915	95KUGCF102BX	1000pF, Ceramic	AA
△C916	95KUGFF473BQ	0.047μF, Film	AB
△C917	95KUGFF683BQ	0.068μF, Film	AB
C918, 919	95KUGAC271NV	270μF, 16V, Electrolytic	AD
C926	95KUGAB101HN	100μF, 10V, Electrolytic	AB
C927	95KUGFF104BQ	0.1μF, Mylar	AC
C930	95KUGZ0755ZZ	470μF, 10V, Electrolytic	AD
△C934, 935	95KUGCZ102BQ	1000pF, 500V, Ceramic	AB

RESISTORS			
△R902, △ 934	95KUECC685AE	6.8M ohm, 1/2W, Solid	AB
△R903	95KUEFG5R6AA	5.6 ohm, 5W, Oxide Film	AD
△R904	95KUEEC563AT	56k ohm, 1/2W, Carbon	AA
△ 907			
△R908	95KUEFD273BF	27k ohm, 1W, Oxide Film	AB
△R909, △ 912	95KUEFD333BF	33k ohm, 1W, Oxide Film	AB
△R913, △ 914	95KUEEC824AT	820k ohm, 1/2W, Carbon	AA
△R915	95KUEEB180BF	18 ohm	AA
△R916	95KUEEC471AT	470 ohm, 1/2W, Carbon	AA
△R917	95KUEEC271AT	270 ohm, 1/2W, Carbon	AA
△R919, △ 922	95KUEEB472BF	4.7k ohm	AA
△R920	95KUEEB153BF	15k ohm	AA

Ref. No.	Part No.	Description	Code
△R921	95KUEEB154BF	150k ohm	AA
△R923	95KUEEB100BF	10 ohm	AA
△R924	95KUEEB103BF	10k ohm	AA
△R925	95KUEEB391BF	390 ohm	AA
△R926, △ 927	95KUEEB122BF	1.2k ohm	AA
△R931	95KUEFC8R2AV	8.2 ohm, 1/2W	AB
△R932	95KUEFCR56AW	0.56 ohm, 1/2W	AA
△R938	95KUEBBR22AN	0.22 ohm, Fuse Resistor	AC
△R939	95KUEEB473BF	47k ohm	AA

MISCELLANEOUS			
△F901	95KPJCTB2001	Fuse, T2A, 250V	AD
△	95KPCZ0112ZZ	Plug, (for AC Cord)	AH
	95KPKZ0449ZZ	Socket, 9 pin (PA)	AD

INFRARED REMOTE CONTROL CIRCUIT			
	RRMCG0798GESA	Infrared Remote Control Unit	AW

TRANSISTOR			
Q3001	92P3SN00059T	2SC4040	AC

INTEGRATED CIRCUIT			
IC3001	92P3SQ00437M	UPD6600GS-556	AQ

DIODES AND FILTER			
D3001	92P3QH00027	SLR-932	AE
D3002, 3003, 3006, 3007	92P3SD00047T	1SS133	AD
CF3001	92P3EF00066	Ceramic Filter, 455kHz	AD

CABINET PARTS			
1	92PFA11H9601	Cabinet-A	AL
2	92PFA11H9701	Cabinet-B	AL
3	92PFA11H9801	Cabinet-C	AE
4	92PFA62D4203	Marking Plate	AK

Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
5	92PFA42C9903	Contact Rubber	AM	33	MLEVF0350GEZZ	Relay Gear Drive Lever	AF
6	92PFA58B6201	Infrared Filter	AC	34	MSLiF0043GEZZ	Brake Shifter	AK
7	—	PWB	—	35	NSFTZ0068GEFD	Brake Lock Shaft	AC
8	92P3ETFD4801	Terminal-C	AC	36	MSPRC0143GEFJ	Absorber Plate Spring	AB
9	92P2A461080	Screw	AA	37	MSPRT0274GEFJ	Video Search Spring	AB
				38	MLEVP0181GEZZ	Video Search Brake Lever	AA
				39	MLEVP0131GEZZ	Video Search Reciprocating Lever	AC
				40	RPLU-0083GEZZ	Brake Solenoid Ass'y	AF
				41	NDAiV1046GEZZ	Take-Up Reel Disk Ass'y	AG
				42	NGERH1128GEZZ	Idler Gear Ass'y	AN
				43	NPLYV0134GEZZ	Reel Pulley	AC
				44	MSPRD0085GEFJ	Shifter Spring	AB
				45	PCOV01018GEZZ	Shifter Spring Cover	AC
				46	LHLD01092GEZZ	Cassette LED Holder	AE
				47	RH-PX0180GEZZ	Cassette LED	AD
				48	QPWBF2977GEZZ	Reel Sensor PWB	AK
				49	RH-PX0181GEZZ	Reel Sensor	AE
				50	LCHSS0016GEZZ	Reel Block Chassis	AL
				51	MLEVP0134GEZZ	Tension Adjusting Lever	AC
				52	MLEVP0195GEZZ	Tension Release Lever	AC
				53	MLEVP0132GEZZ	Back Tension Lever	AC
				54	MSPRT0273GEFJ	Back tension lever spring	AB
				55	NDAiV1047GEZZ	Supply Reel Disk Ass'y	AH
				56	MSPRT0272GEFJ	Main Brake Spring	AC
				57	MLEVP0135GEZZ	Intermediate Lever	AC
				58	MLEVP0129GEZZ	Main Take-Up Brake Lever	AE
				59	MLEVP0128GEZZ	Main Supply Brake Lever	AE
				60	NGERH1121GEZZ	Loading Relay Gear	AA
				61	MSPRT0271GEFJ	Loading Reciprocating Spring	AA
				62	NGERH1120GEZZ	Take-Up Loading Gear	AA
				63	MLEVF0304GEZZ	Take-Up Loading Arm Ass'y	AC
				64	NGERH1119GEZZ	Supply Loading Gear	AA
				65	MLEVF0303GEZZ	Supply Loading Arm Ass'y	AC
				66	LCHSM0123GEZZ	Main Chassis Ass'y	AT
				67	LBNDK1002GEZZ	Tension Band Ass'y	AD
				68	LHLDZ1607GEZZ	Tension Spring Hook Plate	AA
				69	MSPRT0275GEFJ	Tension Spring	AA
				70	MLEVF0291GEZZ	Tension Arm Ass'y	AF
				72	MSLiF0049GEFW	Take-Up Pole Base Slider	AB
				73	LPOLM0037GEZZ	Take-Up Pole Base Ass'y	AG
				74	NROLP0062GEZZ	Guide Roller Ass'y	AE
				75	MSLiF0048GEFW	Supply Pole Base Slider	AB
				76	LPOLM0036GEZZ	Supply Pole Base Ass'y	AG
				77	PGiDM0066GEZZ	Take-Up Loading Rail	AB
				78	PGiDM0067GEZZ	Supply Loading Rail	AB
				79	NSFTL0563GEFW	Supply Impedance Roller	AC
				80	PGiDH0031GEFW	Supply Impedance Roller Flange	AA
				81	NROLP0084GEZZ	Supply Impedance Roller	AD
				82	RHEDT0026GEZZ	Full Erase Head Ass'y	AK
				83	QPWBF2936GEZZ	Full Erase Head PWB	AA
				84	LANGA0054GEZZ	Supply Reel Retainer Ass'y	AD

THE OTHER PARTS

△	QACCV2033GEZZ	AC Cord	AN
	QCNW-2702GEZZ	Connecting Cord	AK
	TiNS-1812GEZZ	Operation Manual	AE

MECHANISM CHASSIS PARTS

1	PGiDS0023GEFW	Retaining Guide	AE
2	MSPRC0142GEFJ	Retaining Guide Spring	AA
3	MLEVC0022GEZZ	Half-Loading Lever	AF
4	MSPRT0270GEFJ	Half-Loading Lever Spring	AA
5	MLEVF0284GEFW	Half-Loading Drive Lever	AC
6	MSPRT0269GEFJ	Half-Loading Reciprocating Spring	AA
7	MLEVF0283GEZZ	Half-Loading Reciprocating Lever	AB
8	MSPRC0144GEFJ	Azimuth Spring	AA
9	RHEDU0070GEZZ	Audio/Control Head Ass'y	AS
10	PCAPS1015GEZZ	Retaining Guide Cap	AA
11	QPWBF3777GEZZ	Audio/Control Head PWB	AB
12	MLEVF0292GEZZ	Audio/Control Head Arm	AD
13	MSPRD0087GEFJ	Audio/Control Head Arm Spring	AA
14	LHLDZ1606GEZZ	Loading Block Holder Ass'y	AC
15	QPRBF3817GEZZ	Loading Block PWB	AD
16	RMOTM1049GEZZ	Loading Motor	AM
17	QPLGN0580GEZZ	Plug, 5 pin (MG)	AB
18	QSW-R0026GEZZ	Cam Switch	AE
19	NGERW1032GEZZ	Worm Wheel	AC
20	NPLYV0133GEZZ	Loading Motor Pulley	AC
21	NBLTK0058GE00	Loading Belt	AA
22	NGERW1031GEZZ	Worm Ass'y	AC
23	NSFTG0045GEFJ	Worm Shaft	AB
24	NGERH1129GEZZ	Master Cam	AC
25	MLEVF0281GEZZ	Pinch Roller Lever Ass'y	AN
26	MLEVF0348GEZZ	Relay Shifter Lever	AD
27	MLEVC0033GEZZ	Reverse Guide	AG
28	MSPRD0086GEFJ	Reverse Guide Spring	AA
29	RMOTN2038GEZZ	Capstan D.D. Motor	AZ
30	MLEVP0136GEZZ	Slow Brake Lever	AA
31	MSPRT0329GEFJ	Slow Brake Spring	AA
32	MSPRC0151GEFJ	Reverse Guide Spring	AA

Ref. No.	Part No.	Description	Code	Ref. No.	Part No.	Description	Code
85	NBLTK0059GE00	Reel Belt	AB	307	MSPRT0290GEFJ	Cassette Cover Arm	AA
86	MLEVP0146GEZZ	Auxiliary Fast-Forward Brake Lever	AE	308	MSPRD0088GEFJ	Reciprocating Spring	AA
87	MSPRT0282GEFJ	Auxiliary Fast-Forward Brake Spring	AB	309	NGERW1034GEZZ	Drive Gear Spring (Right)	AA
89	DDRMU0002HE39	Upper Drum Ass'y	BB	310	NGERW1034GEZZ	Drive Gear (Right)	AB
90	PGIDC0044GEFW	Drum Base	AK	311	MSPRT0277GEFJ	Reciprocating Spring	AA
91	DDRML0012HE01	Lower Drum Ass'y	BB	312	NGERW1033GEZZ	Worm Wheel Gear	AB
92	QBRSK0025GEZZ	Earth Brush Ass'y	AD	313	LANGF9355GEFW	Worm Bracket	AB
93	RMOTP1107GEZZ	Drum D.D. Motor Ass'y	AW	314	NBRGP0013GEZZ	Bearing	AA
97	QCNW-6686GEZZ	Full Flat Cable	AL	315	MLEVP0142GE00	Open Lever	AA
98	QCNW-6674GEZZ	Full Flat Cable	AD	316	MSPRD0091GEFJ	Open Lever Spring	AA
99	RDTCH0018GEZZ	Dew Sensor	AG	317	MLEVP0192GEZZ	Switching Lever	AB
100	QSOCN0534REZZ	Socket, 5 pin (MF)	AC	318	MSPRT0280GEFJ	Switching Lever Spring	AA
101	VRS-TW2ED221J	220 ohm, 1/4W, 5%, Oxide Film	AA	319	NSFTD0016GEFD	Worm Shaft Ass'y	AC
102	VCKYTV1HB102K	0.001 μ F, 50V, 10%, Ceramic	AA	320	MLEVP0140GEZZ	Clutch Lock Lever	AA
103	VRS-TV1JD473J	47k ohm, 1/16W, 5%, Oxide Film	AA	321	MSPRT0279GEFJ	Clutch Lock Lever Spring	AA
105	LANGA0051GEFW	Take-Up Reel Disk Catch Holder	AB	322	MLEVP0139GEZZ	Clutch Release Lever	AA
106	PGIDS0027GEZZ	Supply Impedance Roller Flange L	AA	323	MSPRD0092GEFJ	Clutch Release Lever Spring	AA
111	LANGF7061GEZZ	Release Pin Angle Ass'y	AC	324	MLEVP0138GEZZ	Clutch Lever	AA
120	CCHSS0018GE02	Reel Block Ass'y	AZ	325	NPLYV0135GEZZ	Pulley	AA
123	ZTAPEZ790008E	Rubber Mat	AA	326	NBLTK0060GE00	Cassette Loading Belt	AB
124	LHLDW3009GEZZ	Wire Holder	AA	327	LANGF9354GEFW	Upper Plate	AD
125	QPLGN0378GEZZ	Plug, 3 pin	AB	328	LHLDX1011GE00	Slider Holder (Left)	AB
126	QPLGN0578GEZZ	Plug, 5 pin	AB	329	MSPRP0135GEFJ	Cassette Spring	AB
127	QCNW-6687GEZZ	Full Erase Head Lead	AC	330	LANGF9357GEFW	Slider Lock (Left)	AA
128	CLEVP0208GE00	AHC Drive Lever Ass'y	AE	331	MSPRT0281GEFJ	Slider Lock Spring	AA
129	CLEVP0209GE00	AHC Roller Ass'y	AG	332	MSLIF0044GEFW	Slider	AF
130	RC-KZ0019GEZZ	Capacitor	AA	333	MLEVP0137GE00	Lock Release Lever	AA
135	94SSEE0193721A	Drum IC	AU	334	MSPRD0093GEFJ	Lock Release Lever Spring	AA
136	94SSEE0193731A	Capstan IC	AU	335	MLEVP0143GE00	Slider Lock Cover	AA
137	NFLYV0070GEZZ	Drum Dumper	AF	336	LANGF9356GEFW	Slider Lock (Right)	AA
				337	LHLDX1010GE00	Slider Holder (Right)	AB
				338	NGERW1035GEZZ	Drive Gear (Left)	AB
				339	MSPRD0089GEFJ	Drive Gear Spring (Left)	AA
					LHLDX1015GE00	Cassette Housing Frame (Left)	AC
				340	NSFTD0015GEFD	Main Shaft	AD
				341	QPWBF2894GEZZ	End Sensor PWB	AB
				342	RH-PX0176GEZZ	Phototransistor	AE
				343	QPWBF3194GEZZ	Start Sensor PWB	AC
				344	QSW-F0040GEZZ	Cassette Switch	AD
				345	ZTAPEZ790008E	Rubber Mat	AB
				347	QSOCN0595GEZZ	Socket, 5 pin	AB
				348	VSDTC124F/-1	Transistor	AC
				349	VS2SA937-Q/-1	Transistor	AC
				350	VRD-RA2BE153J	15k ohm, 1/8W, 5%, Carbon	AA
				351	VRD-RA2BE223J	22k ohm, 1/8W, 5%, Carbon	AA
				352	VRD-RA2BE103J	10k ohm, 1/8W, 5%, Carbon	AA
				353	VRD-RA2BE472J	4.7k ohm, 1/8W, 5%, Carbon	AA
				354	VRD-RA2BE332J	3.3k ohm, 1/8W, 5%, Carbon	AA
				355	RC-KZ0028GEZZ	0.047 μ F, 16V, 20%, Ceramic	AA

CASSETTE HOUSING CONTROL PARTS

	CHLDX3060GE51	Cassette Housing Control Assembly	AY
301	PGIDM0069GE00	Down Guide	AC
302	QSW-F0034GEZZ	Cassette Erase Protection Switch	AC
303	LHLDX1014GE00	Cassette Housing Frame (Right)	AC
304	MARMP0043GE00	Cassette Cover Arm (A)	AA
305	MARMP0044GE00	Cassette Cover Arm (B)	AA
306	NGERW1036GEZZ	Phase Gear	AA

Ref. No.	Part No.	Description	Code
356	QCNW-4789GEZZ	Connecting Cord	AF
401	LX-WZ1020GE00	Cut Washer (4.2W-6.0-0.5)	AA
402	LX-HZ3046GEFD	Screw (B Tight BTN3P + 6S)	AA
403	NPLYV0137GEZZ	Coupling	AA
404	NPLYV0136GEZZ	Clutch	AA
405	NGERW1037GEZZ	Worm	AA
406	PSPAZ0301GEZZ	Spacer	AD

SCREWS, NUTS, AND WASHERS

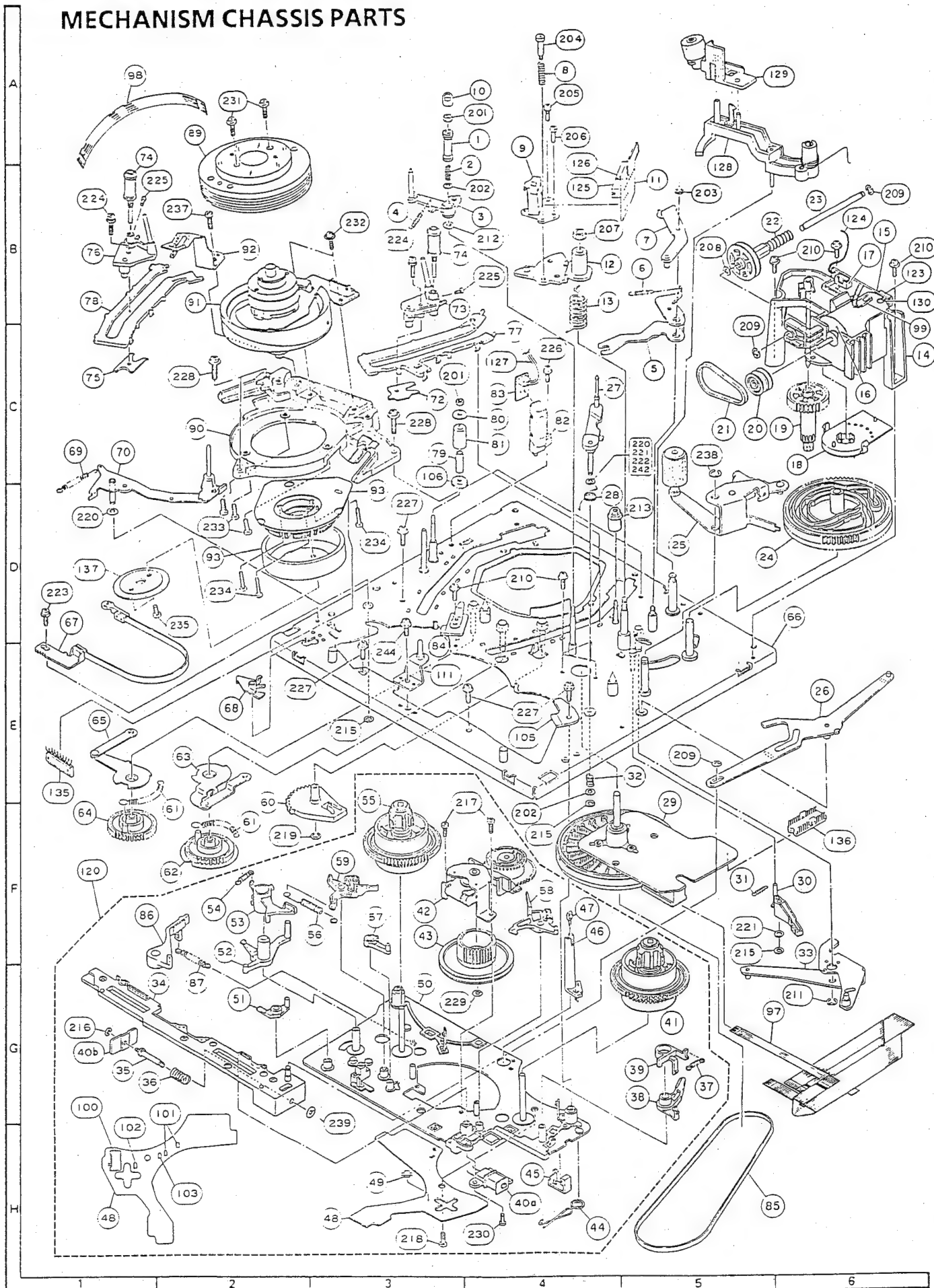
201	XNFSD20-16000	Adjusting Nut	AA
202	XWHS26-05060	Washer W2.6S-6-0.5	AA
203	XRESJ20-04000	E Ring-2	AA
204	LX-BZ3095GEFD	AC Head Screw	AA
205	XBPSD26P06000	Azimuth Adjusting Screw	AA
206	LX-BZ3096GEFD	Tilt Adjusting Screw	AA
207	XNFSD40-31000	Adjusting Nut (A/C Head)	AB
208	LX-WZ1048GEZZ	Washer W3.1-5.4-0.5	AA
209	LX-WZ1041GE00	Washer W2.6-6-0.5 (LM)	AA
210	XHPSD26P06WS0	Screw C2.6P + 6S	AA
211	XRESJ30-06000	E-Ring-3	AA
212	XWHJZ45-02060	Washer PSW4.6-6-0.25	AA
213	LX-NZ3046GEFW	Adjusting Nut	AB
215	LX-WZ1003GE00	Washer CW2.1-5-0.5	AA
216	XRESJ12-03000	E Ring-1.2-T0.3	AA
217	XHPSD26P03000	Screw S2.6P + 3S (S Tight)	AA
218	XHPSD20P03000	Screw S2P + 3S (S Tight)	AA
219	XRESJ25-04000	E Ring-2.5	AA
220	XWHJZ25-05050	Washer W2.6P-5-0.5	AA
221	XWHJZ25-01050	Washer W2.6P-5-0.13	AA
222	XWHJZ25-02050	Washer W2.6P-5-0.25	AA
223	LX-HZ3043GEZZ	Screw W2.6P + 6S	AA
224	LX-BZ3099GEZZ	Screw WSW2P + 11S (W5)	AB
225	LX-XZ3030GEFD	Screw M2x4	AC
226	XHPSD26P08WS0	Screw C2.6P + 8S	AA
227	XJPSD26P08WS0	B Tight Screw C2.6 + 8S	AA
228	XHPSD30P08WS0	Screw C3P + 8S	AA
229	LX-WZ1040GE00	Washer CW2.5-6-0.5	AA
230	XJBSD20P06000	B Tight Screw 2P + 6S	AA
231	LX-BZ3039GEFN	Screw W3P + 9S-Ni	AA
232	LX-HZ3056GEFD	Screw WSW3P + 10S-6W	AA
233	XBPSD30P08J00	Screw SW3P + S8S	AA
234	XBPSD26P12J00	Screw SW2.6 + 12S	AA
235	XBPSD30P05J00	Screw SW3P + 5S	AA
237	XHPSD30P06000	Screw S3P + 6S	AA
238	LX-RZ3001AEZZ	E Ring-3 (Curl)	AA
239	LX-WZ1042GE00	Washer CW2.7-7-0.5	AA
242	XWHJZ25-04050	Washer W2.6P-5-0.4	AA
244	XHPSD30P04WS0	Screw C3P + 4S	AA

Ref. No.	Part No.	Description	Code
MECHANICAL PARTS			
601	GCABB1118GEZZ	Main Frame	AT
602	GCABA3072GEST	Top Cabinet	AR
603	GBDYU3075GEZZ	Bottom Plate	AH
604	GCOVA1694GEZZ	Antenna Terminal Cover	AF
605	LHLDP1089GEZZ	LED Holder	AA
606	LHLDZ1780GEZZ	Holder, Power	AC
607	LHLDZ1794GEZZ	Holder, Fluorescent Display Tube	AC
608	LHLDZ1779GEZZ	Holder, RF Converter	AC
609	MHNG-1060GEZZ	Hinge, Main PWB	AA
610	QEARP0360GEFW	Earth Plate	AB
611	TLABM2209GEZZ	Label, Model	AB
612	LX-HZ3040GEFF	Screw	AA
613	LX-HZ3047GEFF	Screw	AA
614	XEBSD40P12000	Screw	AA
615	XESSF30P10000	Screw	AA
616	XHPS330P06WS0	Screw	AA
617	XEBSD30P12000	Screw	AA
618	LANGF9367GEFW	Fixing Metal	AB
619	LANGF5060GEFW	Angle	AB
620	LX-HZ3056GEFD	Screw	AA

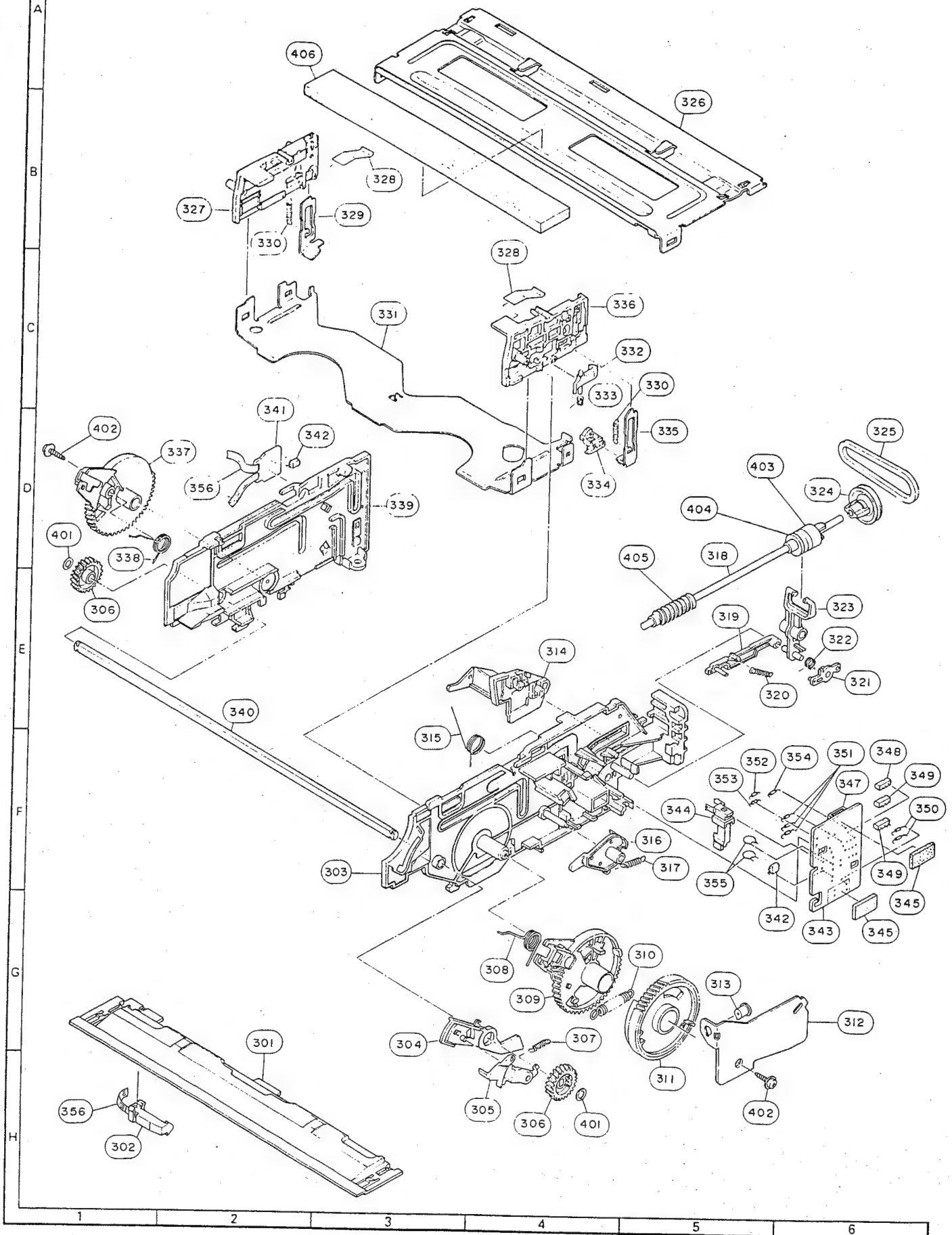
FRONT PANEL PARTS

501	CPNLC1690GE06	Front Panel Ass'y	BA
501-1	CBTN-2501GE01	Operation/Eject Button Ass'y	AE
501-1-1	GCOVA1683GESA	Cover	AC
501-2	CDORF1945GE01	Door Ass'y	AH
501-2-1	TLABH0490GEZZ	Label (Inside the door)	AB
501-3	HBDGB1007GESB	Badge "SHARP"	AD
501-4	HDECQ0800GESA	Cassette Compartment Cover	AH
501-5	HDECQ0801GESA	Display Cover	AL
501-6	HDECQ0802GESA	Decoration Plate	AL
501-7	HiNDP1835GESA	Indication Plate	AF
501-9	JBTN-2508GESA	Button	AE
501-10	LANGF9522GEFW	Fixing Metal	AA
501-11	LHLD51010GEZZ	Door Latch	AA
501-12	MSPRD0123GEFJ	Spring	AA
501-13	PCOVU9200GESB	Fluorescent Display Filter	AF
501-14	QEARP0354GEFW	Earth Plate	AB
501-15	QEARP0355GEFW	Earth Plate	AB
501-16	TLABZ0887GEZZ	Feature Label	AC
501-17	XJPSD20P06XS0	Screw	AA

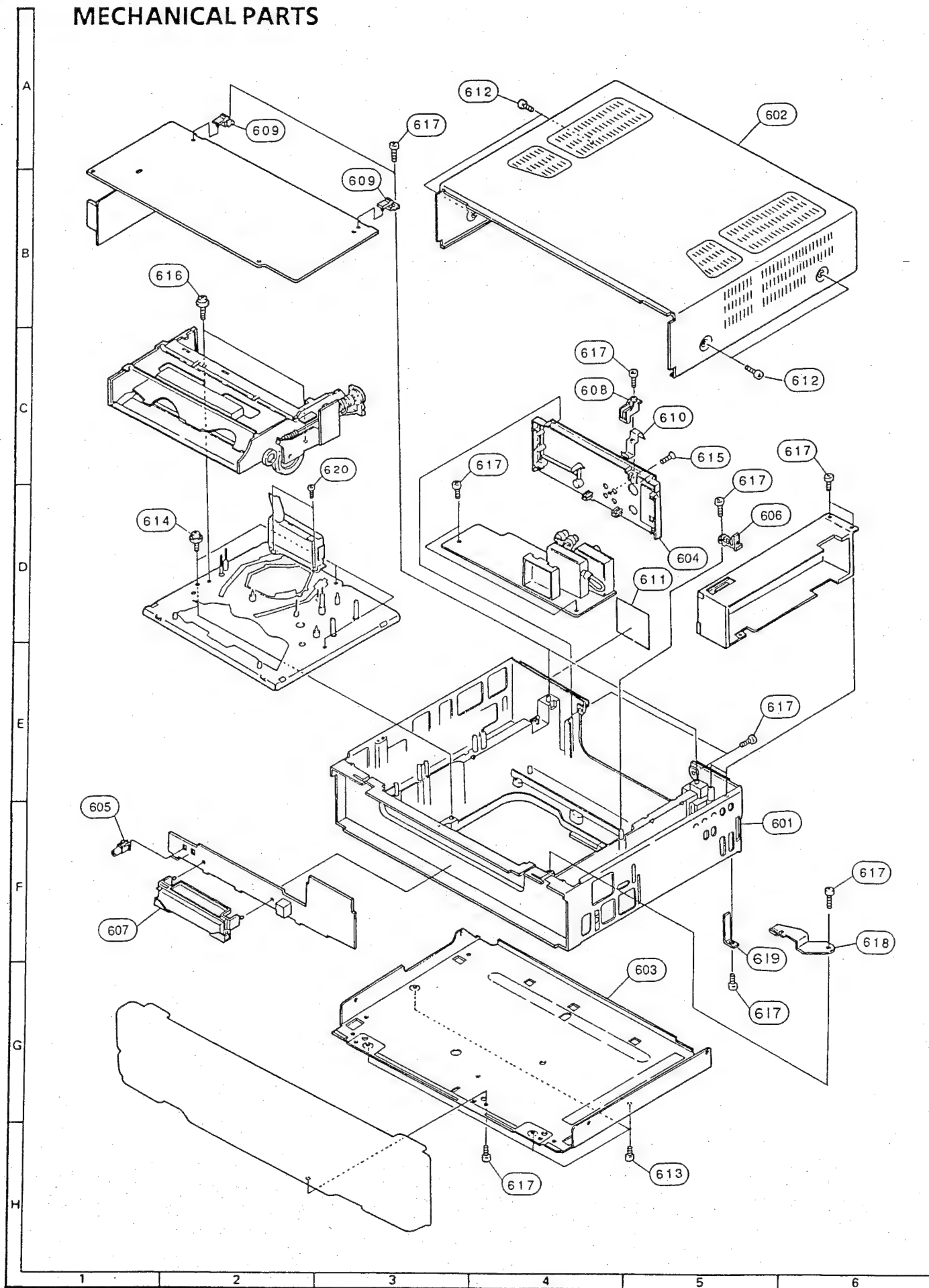
MECHANISM CHASSIS PARTS



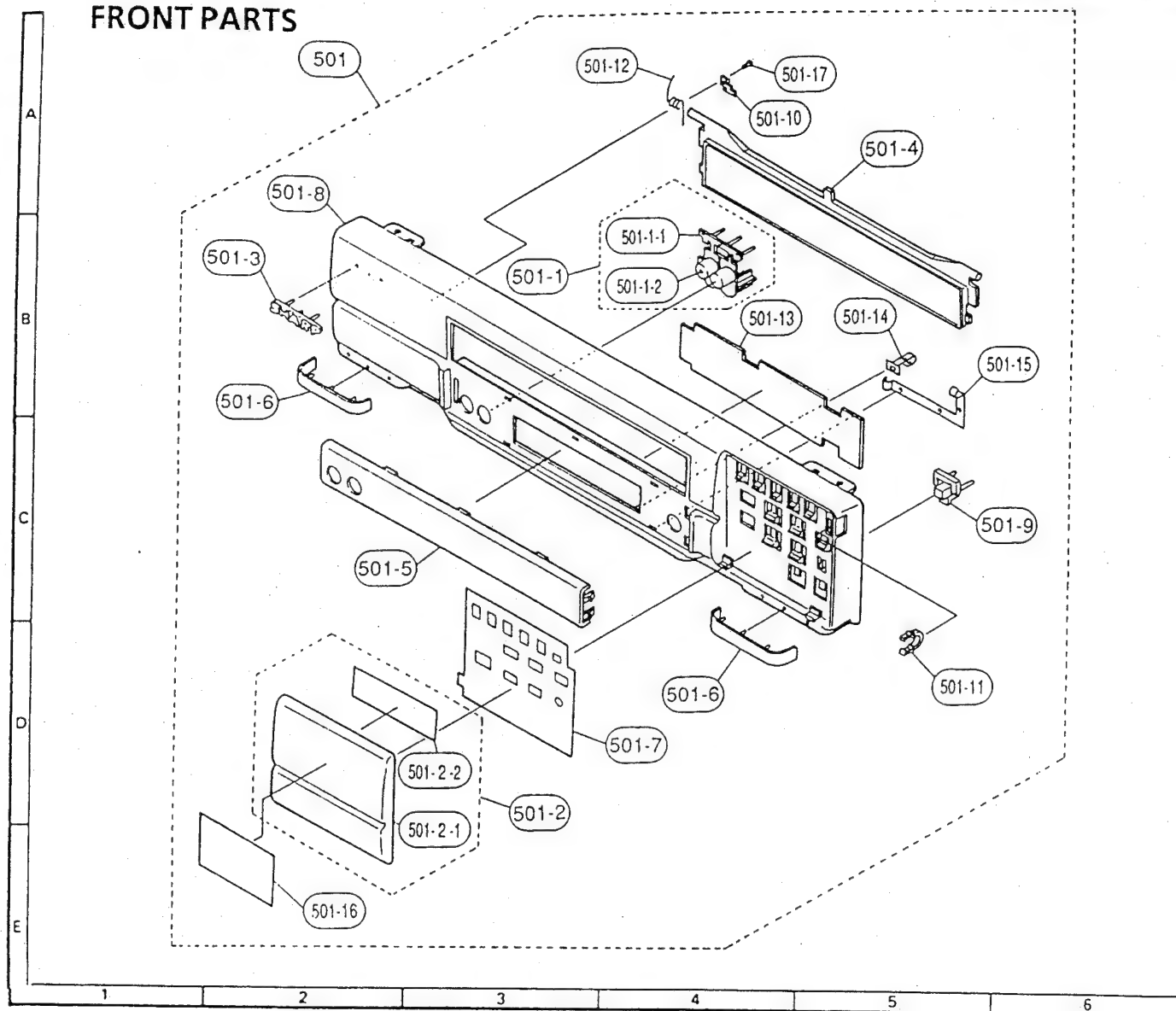
CASSETTE HOUSING CONTROL PARTS



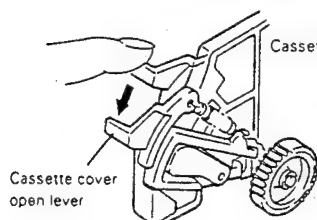
MECHANICAL PARTS



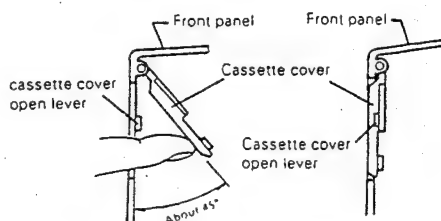
FRONT PARTS



PRECAUTIONS ON FRONT PANEL SET-UP

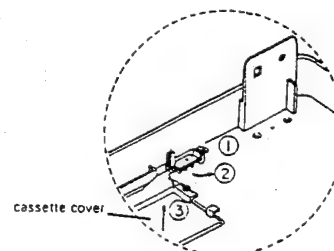


Before attaching the front panel in position make sure that the cassette cover open lever is in its right place (lowermost). If it is out of position, push it down with a finger



keep the cassette cover about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place

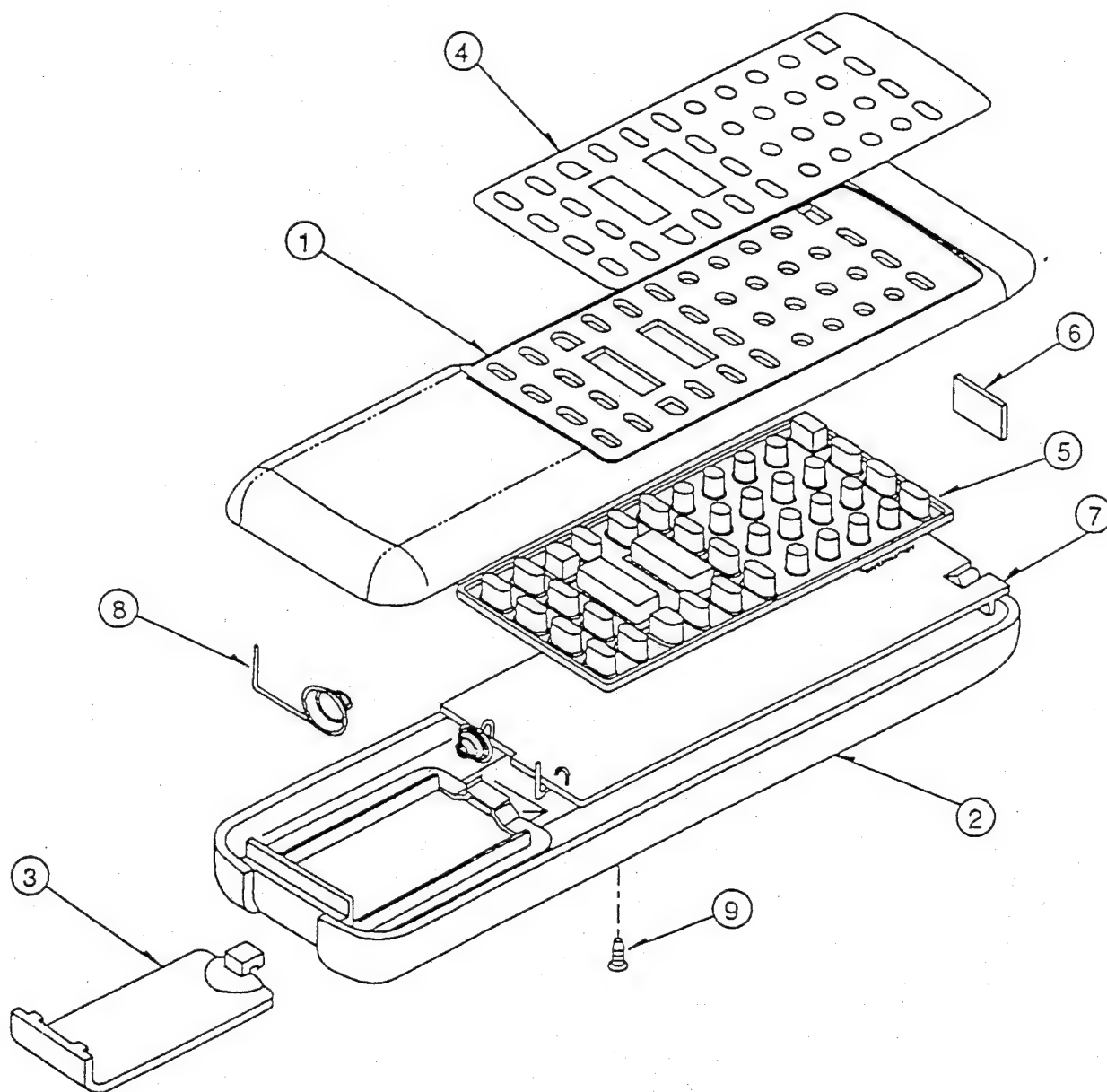
Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing



Removing the cassette compartment cover

1. Loosen the screw ① and turn the fixing metal in the direction of the arrow ②.
2. Lift up the cassette compartment cover in the direction of arrow ③ and remove it from the front panel

INFRARED REMOTE CONTROL UNIT



PACKING OF THE SET

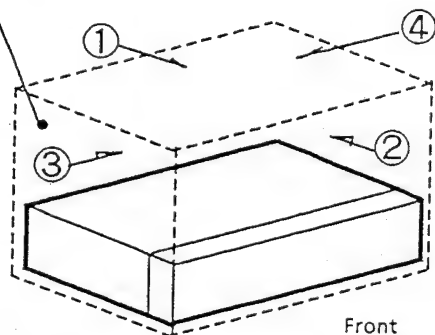
■ Setting position of the Knobs

Test signal switch	at "OFF" position	Edit/Auto picture	at "AUTO PICTURE" position
System switch	at "B/G" position	RF converter	at "E 36" position

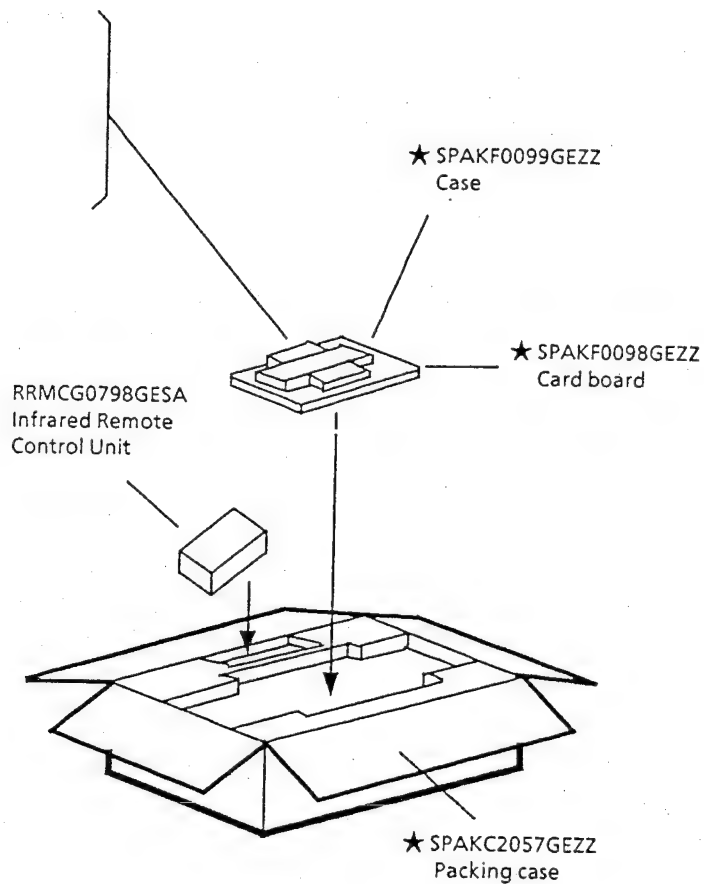
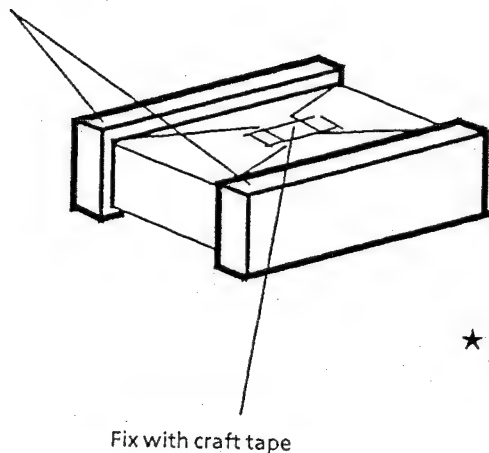
Accessories

- ★ TiNS-1812GEZZ Operation Manual
- ★ QACCV2033GEZZ AC Cord
- ★ QCNW-2702GEZZ Antenna cord
- ★ Dry Battery

- ★ SPAKA0030GEZZ Polystyrene sack



- ★ SPAKX0682GEZZ Buffer material



- ★ TLABN0060GEZZ Tack Label

- ★ TLABK2209GEZZ No. Card

Use 8 staples to fix the bottom of packing case

★ Not Replacement Item

SHARP

TECHNICAL REPORT

SUBJECT: Change of Parts

No. :EEV-625
DATE:April 21, 1992
FROM:Q. R. C. Center
TV & VIDEO SYSTEMS GROUP

The following parts have been changed. Please note this information for your service.

※ Models	Model No.	Serial No.	Model No.	Serial No.	Model No.	Serial No.
	VC-A33BP	311142~	VC-A33E	311131~	VC-A33NZ	312612~
	VC-A33X	322121~	VC-A38NZ	311665~	VC-A38X	315716~
Reason for Change ①	1.To improve performance 4.To meet approved regulation 7.Others 2.Change of material or dimension 5.Standardization 3.To meet approved specification 6.Correction of printed matter					
Inter-changeability ②	A. Completely interchangeable B. Interchangeable from OLD to NEW C. Interchangeable from NEW to OLD D. Not interchangeable <div> <div>OLD ↔ NEW</div> <div>OLD → NEW</div> <div>OLD ← NEW</div> <div>OLD × NEW</div> </div>					

Ref. No.	Description	Old Parts No.	New Parts No.	①	②	Effective from	Price Code	Availa-ble
MAIN CIRCUIT,								
	Plug, 2pin	QPLGN0228TAZZ	QPLGN0278GEZZ	7	C	Dec. /' 91	AA	Apr. /' 92
	Plug, 3pin	QPLGN0328TAZZ	QPLGN0378GEZZ	7	C	Prod.	AB	
IF/TUNER CIRCUIT								
	Plug, 2pin	QPLGN0228TAZZ	QPLGN0278GEZZ	7	C		AA	
HEAD AMP CIRCUIT								
	Plug, 2pin	QPLGN0229TAZZ	QPLGN0280GEZZ	7	C		AB	

Detail of change:Change of Parts Vendor

Note:Refer to Service Manual(Parts List)

※The models affected are as follows.

Model No.	Serial No.	Model No.	Serial No.	Model No.	Serial No.
VC-A43SA	311614~	VC-A63S	312114~	VC-B66WT	312142~
VC-A43S	315119~	VC-A63SV	311612~	VC-B67NT	313712~
VC-A43SV	313515~	VC-A63X	313746~	VC-B68BTN	311912~
VC-A48X	319112~	VC-B34N	319972~	VC-B78DT	374957~
VC-A63BP	311142~	VC-B35D	314813~		
VC-A63NZ	312119~	VC-B36B	312194~		

Printed in Japan

SHARP CORPORATION

TECHNICAL REPORT

SUBJECT: Change of Parts

No. :EEV-684
DATE:Mar. 30, 1993
FROM:Q. R. C. Center
TV & VIDEO SYSTEMS GROUP

The following parts have been changed. Please note this information for your service.

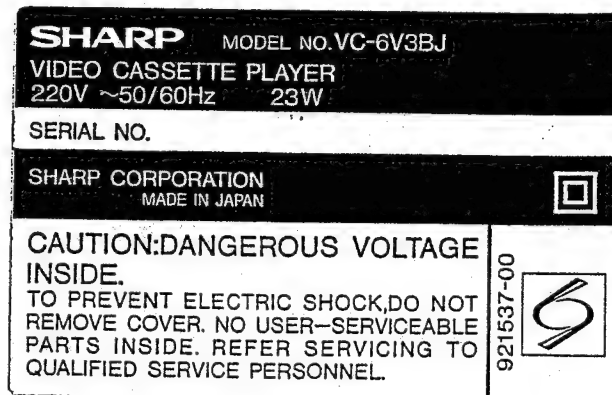
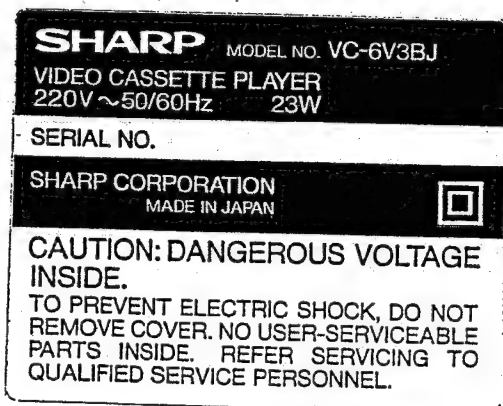
Models	Model No.	Serial No.	Model No.	Serial No.	Model No.	Serial No.
	See	next	page.			
Reason for Change ①	1.To improve performance					

Detail of change: Application of Singapore Safety Standard.

Note:Refer to Service Manual(Parts List---MECHANICAL PARTS)

OLD MODEL LABEL

NEW MODL LABEL



Reason for Change ①	1. To improve performance 4. To meet approved regulation 7. Others							
	2. Change of material or dimension 5. Standardization							
	3. To meet approved specification 6. Correction of printed matter							
Inter-changeability ②	A. Completely B. Interchangeable C. Interchangeable D. Not							
	interchangeable from OLD to NEW from NEW to OLD interchangeable							
	<div> <div>OLD ↔ NEW</div> <div>OLD → NEW</div> <div>OLD ← NEW</div> <div>OLD × NEW</div> </div>							
Model No.	Description	Old Parts No.	New Parts No.	①	②	Effective from	Price Code	Available
VC-6V3BJ	Model Label	TLABM2581GEZZ	TLABM2654GEZZ	7	D	388142~	AB	Jun. / '93
	No. card	TLABK2581GEZZ	TLABK2654GEZZ	7	C		-	-
VC-72ES	Model Label	TLABM2504GEZZ	TLABM2645GEZZ	7	D	316562~	AB	Jun. / '93
	No. card	TLABK2504GEZZ	TLABK2645GEZZ	7	C		-	-
VC-790ET	Model Label	TLABM1746GEZZ	TLABM2643GEZZ	7	D	512985~	AB	Jun. / '93
	No. card	TLABK1746GEZZ	TLABK2643GEZZ	7	C		-	-
VC-82ETS	Model Label	TLABM2501GEZZ	TLABM2649GEZZ	7	D	314012~	AB	Jun. / '93
	No. card	TLABK2501GEZZ	TLABK2649GEZZ	7	C		-	-
VC-90ET	Model Label	TLABM2508GEZZ	TLABM2653GEZZ	7	D	316512~	AB	Jun. / '93
	No. card	TLABK2508GEZZ	TLABK2653GEZZ	7	C		-	-
VC-A31N	Model Label	TLABM2043GEZZ	TLABM2639GEZZ	7	D	370798~	AB	Jun. / '93
	No. card	TLABK2043GEZZ	TLABK2639GEZZ	7	C		-	-
VC-B36B	Model Label	TLABM2209GEZZ	TLABM2635GEZZ	7	D	335185~	AB	Jun. / '93
	No. card	TLABK2209GEZZ	TLABK2635GEZZ	7	C		-	-
VC-B68BTN	Model Label	TLABM2348GEZZ	TLABM2640GEZZ	7	D	319512~	AB	Jun. / '93
	No. card	TLABK2348GEZZ	TLABK2640GEZZ	7	C		-	-
VC-H87NT	Model Label	TLABM2352GEZZ	TLABM2641GEZZ	7	D	314714~	AB	Jun. / '93
	No. card	TLABK2352GEZZ	TLABK2641GEZZ	7	C		-	-
VC-H91ETS	Model Label	TLABM2503GEZZ	TLABM2646GEZZ	7	D	313912~	AB	Jun. / '93
	No. card	TLABK2503GEZZ	TLABK2646GEZZ	7	C		-	-
VC-H93	Model Label	TLABM2510GEZZ	TLABM2652GEZZ	7	D	313212~	AB	Jun. / '93
	No. card	TLABK2510GEZZ	TLABK2652GEZZ	7	C		-	-
VC-H96ETS	Model Label	TLABM2502GEZZ	TLABM2647GEZZ	7	D	313619~	AB	Jun. / '93
	No. card	TLABK2502GEZZ	TLABK2647GEZZ	7	C		-	-
VC-H980ETS	Model Label	TLABM2527GEZZ	TLABM2648GEZZ	7	D	313262~	AB	Jun. / '93
	No. card	TLABK2527GEZZ	TLABK2648GEZZ	7	C		-	-
VC-H99ETS	Model Label	TLABM2550GEZZ	TLABM2644GEZZ	7	D	311812~	AB	Jun. / '93
	No. card	TLABK2550GEZZ	TLABK2644GEZZ	7	C		-	-
VC-K20N	Model Label	TLABM2565GEZZ	TLABM2634GEZZ	7	D	311142~	AB	Jun. / '93
	No. card	TLABK2565GEZZ	TLABK2634GEZZ	7	C		-	-
VC-K20N	Model Label	TLABM2565GENA	TLABM2634GENA	7	D	516612~	AB	Jun. / '93
	No. card	TLABK2565GENA	TLABK2634GENA	7	C		-	-
VC-K28B	Model Label	TLABM2580GEZZ	TLABM2633GEZZ	7	D	1st set~	AB	Jun. / '93
	No. card	TLABK2580GEZZ	TLABK2633GEZZ	7	C		-	-
VC-K28B	Model Label	TLABM2580GENA	TLABM2633GENA	7	D	515712~	AB	Jun. / '93
	No. card	TLABK2580GENA	TLABK2633GENA	7	C		-	-
VC-K700NT	Model Label	TLABM2570GEZZ	TLABM2637GEZZ	7	D	314013~	AB	Jun. / '93
	No. card	TLABK2570GEZZ	TLABK2637GEZZ	7	C		-	-
VC-K800BT	Model Label	TLABM2374GEZZ	TLABM2642GEZZ	7	D	317312~	AB	Jun. / '93
	No. card	TLABK2374GEZZ	TLABK2642GEZZ	7	C		-	-
VC-K803BT	Model Label	TLABM2421GEZZ	TLABM2636GEZZ	7	D	312615~	AB	Jun. / '93
	No. card	TLABK2421GEZZ	TLABK2636GEZZ	7	C		-	-
VC-K98ETN	Model Label	TLABM2202GEZZ	TLABM2651GEZZ	7	D	318765~	AB	Jun. / '93
	No. card	TLABK2202GEZZ	TLABK2651GEZZ	7	C		-	-
VC-V18E	Model Label	TLABM2486GEZZ	TLABM2655GEZZ	7	D	330265~	AB	Jun. / '93
	No. card	TLABK2486GEZZ	TLABK2655GEZZ	7	C		-	-
VC-WD1	Model Label	TLABM2448GEZZ	TLABM2650GEZZ	7	D	314384~	AB	Jun. / '93
	No. card	TLABK2448GEZZ	TLABK2650GEZZ	7	C		-	-

TECHNICAL REPORT

SUBJECT: Change of Parts

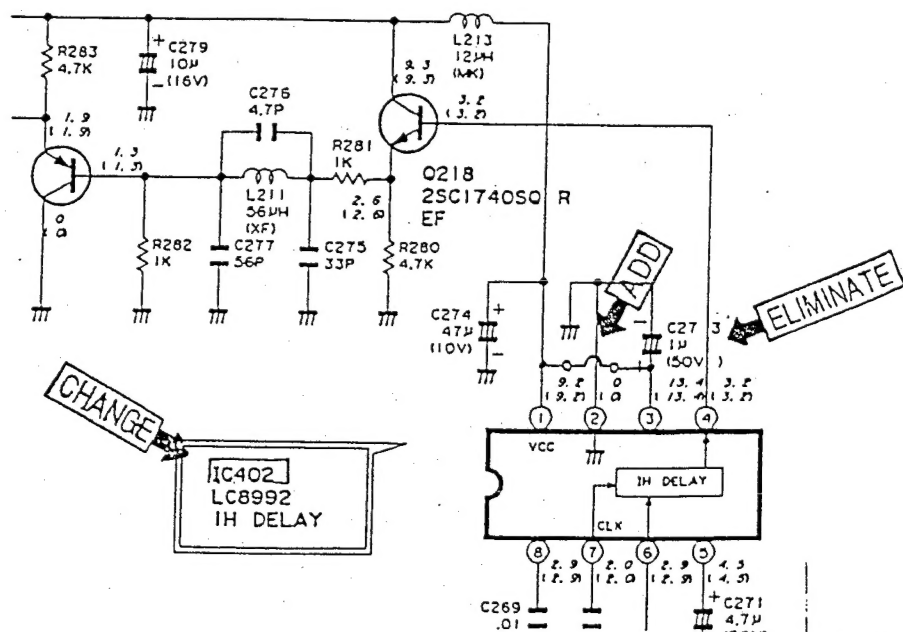
No. :EEV-664
DATE:Nov. 20, 1992
FROM:Q. R. C. Center
TV & VIDEO SYSTEMS GROUP

The following parts have been changed. Please note this information for your service.

Models	Model No.	Serial No.	Model No.	Serial No.	Model No.	Serial No.		
	"Refer to attached sheet"							
Reason for Change ①	1.To improve performance 4.To meet approved regulation 7.Others 2.Change of material or dimension 5.Standardization 3.To meet approved specification 6.Correction of printed matter							
Inter-changeability ②	A. Completely interchangeable B. Interchangeable from OLD to NEW C. Interchangeable from NEW to OLD D. Not interchangeable <div>OLD ↔ NEW</div> <div>OLD → NEW</div> <div>OLD ← NEW</div> <div>OLD × NEW</div>							
Ref.No.	Description	Old Parts No.	New Parts No.	①	②	Effective from	Price Code	Availa-ble
IC402		VHILC8992//-1	VHIMSM7401R-1	7	D	Oct./'92	AG	Feb./'93
C273	1μF	VCEAEA1HW105M	Eliminated	7	-		-	
JC107	Jumper wire	Not used	QJUM-1002GEFW	7	-		-	

Detail of change:Cost reduction

Note:Refer to Service Manual(Schematic diagram:Y/C CIRCUIT)



---to be continued---

MODEL LIST

Model No.	Serial No.	Model No.	Serial No.	Model No.	Serial No.
VC-A33BP	315742~	VC-A63S(GY)	313314~	VC-K801DT	312136~
VC-A33E	314431~	VC-A63SV(GY)	312112~	VC-B34NM	637111~
VC-A33NZ	315012~	VC-A63X	316246~	VC-H83G	312914~
VC-A33X	346221~	VC-A64NZ	311613~	VC-H83X	323213~
VC-A38NZ	312665~	VC-A64X	312613~	VC-H84X	316513~
VC-A38X	319216~	VC-A67S(GY)	312614~	VC-H85G	313316~
VC-A43SA	311614~	VC-A67SV(GY)	312112~	VC-H85X	334026~
VC-A43S(GY)	317819~	VC-B34N	324467~	VC-H86NZ	312515~
VC-A43SV(GY)	315815~	VC-B35D	317658~	VC-H86S	312317~
VC-A47S(GY)	315813~	VC-B36B	323625~	VC-H86WT	314614~
VC-A47SV(GY)	312612~	VC-B66WT	315117~	VC-H87G	311612~
VC-A48S(GY)	311613~	VC-B67NT	319512~	VC-H87NT	313914~
VC-A48X	329512~	VC-B67SA	311142~	VC-H87X	316902~
VC-A63BP	313142~	VC-B68BTN	317012~	VC-H89S	311864~
VC-A63NZ	313219~	VC-B78DT	475607~	VC-95HT	313915~

(6-183)

SHARP

Technical Report

SUBJECT: Change of Parts

NO. : EEV-723

DATE : JAN.25,1994

FROM: Q.R.C.Center

TV & VIDEO Systems

The following parts have been changed. Please note this information for your service.

	MODEL	SERIAL NO.	MODEL	SERIAL NO.	MODEL	SERIAL NO.	MODEL	SERIAL NO.
MODELS	REFER TO	NOTE						

Reason for change
①

1.To improve performance. 4.To meet approved regulation. 7.Others.
2.Change of material or dimension. 5.Standardization.
3.To meet approved specification. 6.Correction of printed matter.

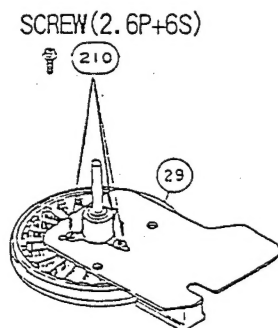
Interchangeability
②

A: Completely interchangeable OLD ↔ NEW
B: Interchangeable from OLD to NEW. OLD → NEW
C: Interchangeable from NEW to OLD. OLD ← NEW
D: Not interchangeable. OLD X NEW

REF.NO.	DESCRIPTION	OLD PARTS	NEW PARTS	①	②	EFFECTIVE FROM	PRICE CODE	AVAILABLE
29	CAPSTAN D.D. MOTOR	RMOTN2038GEZZ	RMOTN2048GEZZ	5	A	NOV./ 93	AZ	JAN./ 94
210	SCREW(2.6P+6S)	XHPSD26P06WS0	XHPSD26P06000	5	A		AA	

DETAIL OF CHANGE:

NOTE:



CAPSTAN D.D. MOTOR

MODEL NO.	SERIAL NO.	MODEL NO.	SERIAL NO.	MODEL NO.	SERIAL NO.
VCA33BP	367188~	VCA33E	315431~	VCA33NZ	315012~
VCA33X	346221~	VCA38NZ	312665~	VCA38X	319216~
VCA43SA	312114~	VCA43S	317819~	VCA43SV	315815~
VCA45U	311147~	VCA47S	315613~	VCA47SV	317592~
VCA47U	311122~	VCA48S	315063~	VCA48X	329512~
VCA504U	311170~	VCA55U	311138~	VCA63BP	329242~
VCA63NZ	313219~	VCA63S	313314~	VCA63SV	312112~
VCA63X	316246~	VCA64NZ	313712~	VCA64X	317813~
VCA66U	311134~	VCA67SH	315914~	VCA67SV	313112~
VCB34N	324967~	VCB35D	321606~	VCB36B	359115~
VCB66WT	316117~	VCB67NT	322112~	VCB67SA	311142~
VCB68BTN	321450~	VCB78DT	505107~	VCG975U	313118~
VCB21E	312662~	VCH600NT	313913~	VCH75C	319412~
VCH75U	335804~	VCH8185T	313714~	VCH83G	312914~
VCH83X	323213~	VCH84X	326113~	VCH85C	313712~
VCH85G	313316~	VCH85U	331334~	VCH85X	324026~
VCB86C	313712~	VCH86NZ	313015~	VCH86SH	312317~
VCB86U	322114~	VCH86WT	314614~	VCH87C	1st set~
VCB87G	312112~	VCH87NT	314714~	VCH87U	312619~
VCH87X	324212~	VCH89S	313864~	VCH95	314618~
VCH95NT	311613~	VCH95U	312120~	VCH96U	317291~
VCH98U	1st set~	VCK38B	317512~	VCK38D	386118~
VCV18E	330815~	VCV8B	463613~	VCV8(3)	328495~
VC6V3BJ	549382~	VC70EN	323552~	VC71ET	313398~
VC870E	323862~	VC9HN	313717~	VC95HT	314415~